RAILROAD GAZETTE

FRIDAY, DECEMBER 1, 1899.

CONTENTS.

ILLUSTRATIONS:	PAGE
Electro-Pneumatic Interlocking at the Boston Southern Station—With an Inset	822
Flexible Locomotive Stay Bolts—Mexican Central Ry.	824
The Jones Car Door.	824
Schenectady Ten-Wheelers for the Northern Pacific	825
A Reversible Pilot Coupler	826
The Kinetic Motor.	827
An Extension Car Step	827
CONTRIBUTIONS:	
Metal Draft Beams and Car Repairs	821
The Am. Soc. C. E. Rail Section	821
EDITORIAL:	
Freight Car Repairs	828
EDITORIAL NOTES	828, 829
New Publications	829
Trade Catalogues	829
GENERAL NEWS:	
Locomotive Building	832
Car Building	832
Bridge Building	832

GENERAL NEWS:	PAGE
Meetings and Announcements	833
Personal	834
Elections and Appointments.	834
Railroad Construction	835
General Railroad News	836
Traffic	836
MISCELLANEOUS:	
Technical	830
The Scrap Heap	830
Mr. Ripley on Pools and State Regulation of Railroads	821
Electricity or Steam on Branch Lines	823
Is Your Excursion Business Profitable?	823
The East River Tunnel of the Long Island Railroad	825
The Chicago Drainage Canal	825
The Railroads and the Farmers	825
Accidents to Passengers in England and America	826
The Delaware & Hudson Pushing Engines	826
A Fast French Express Train	826
Foreign Railroad Notes	827

Contributions.

Metal Draft Beams and Car Repairs.

New York, November 20, 1899.

To the Editor of the Railroad Gazette:

I have read with considerable interest the editorial in last week's Gazette on "Metal Draft Beams and Car Repairs," and notice the difference in estimates and figures furnished you by the different railroads. I think if you will make some inquiries you will find that the roads reporting a large percentage of repairs due to defective draft rigging are roads whose draft rigging is not protected by dead woods or dead blocks.

S. M. P.

The Am. Soc. C. E. Rail Section.

New York, Nov. 18, 1899.

To the Editor of the Railroad Gazette:

Referring to the American Society rail section, I had a letter written to you and was just about to send it, when your issue of the 10th was received and I read Mr. Raymond's communication. As what I had to say in the matter was quite similar to what his letter presented, I have delayed a reply until some of the general points could be treated a little more in detail.

It seems to me that conformity to the type of section has been preserved to the disadvantage of the section as it is applied to the heavier rails. While I personally know nothing of the value of the point so frequently alluded to, that the manipulation of the steel is better at a lower temperature than a higher one in final passes, I do not at all question that such is the case, and other vital points in the structure of the rail being equal, do not question that the greatest attainable hardness in the head with a given chemical constitution, is a desirable point in the heavy rails as it is in the light rails.

The main question is whether the best section for heavy rail is the one suggested by the American Society. I think it quite likely for security that the rail shall not have an undue tendency to overturn, that the base of a symmetrical rail should be at least as wide as the height of the rail. To secure the nearest approach to uniformity of the areas of the three members of the rail would seem to result in the lowest attainable measure of internal strains. The stiffness of the rail in both directions vertically would probably ensue with the neutral axis near the center of height.

I enclose two blue prints, one of the standard 100-lb. rail, and a suggested section of equal weight and stiffness. While the relative stiffness is perhaps easily determined, I find it rather difficult to prove by calculation that the depth of head can be reduced to the extent which is shown by the prints.

You published in 1892 some information from Mr. Hawks which described the performance of some rails of 80-lb. section precisely like the standard 80-lb. section, which were put under severe service after having in one instance ½ in. of the depth of the head planed off, and in another instance, ¾ in. of the depth of the head planed off, which it might be well to reprint. If any one can determine to his satisfaction for what distance along the head of the rail in the neighborhood of the top of the neck, the load upon the rail is supported, I suppose it will be easy to determine whether the depth of the head of the rail, shown on the print, is sufficient for the wear that will be required of it. Many trackmen think that if the fastening at the joint is about as stiff as the rail is at other points, the service of the rails will be improved. This may be true, and if it is, I suppose it follows that the deeper angle plates are advantageous.

I have taken the liberty in the construction of the rail section, whose extreme dimensions are 6⅛ in., to preserve the apex height of the flange, and it follows that the edges of the flange are a trifle thinner than the edges of the flange of the standard section. Deeming it a fair conclusion that inasmuch as there is no material wear of spikes by heavy traffic on an 80-lb. section, there will be no material wear of spikes holding a stiffer section of rail if the edges of the flanges thereof are slightly less in height, and I suppose that the filling of the rolls can be accomplished practically just as well with a flange slightly thinner at the edge.

I do not, of course, offer the suggested section as superior to the American Society standard section, but I offer it as one which illustrates, in some measure, Mr. Raymond's article, which as I said before, embodies the points in regard to the section which had come to my mind.

ENGINEER.

Mr. Ripley on Pools and State Regulation of Railroads.

The statements made by George F. Stone, Secretary of the Chicago Board of Trade, before the sub-committeen of the Congressional Industrial Commission, at Chicago, against pooling of railroad receipts, were so radical and extreme that Mr. Ripley, President of the Atchison, Topeka & Santa Fe, has submitted to the Congressional Committee a reply to the assertions of Mr. Stone. Mr. Ripley said in part:

"This witness evidently thinks the strongest case he can cite to show the iniquity of the pool is the Southwestern Traffic Association, which, he says, was a 'vampire which for a decade sucked the life blood of the commerce of the Missouri Valley.' How does he reconcile this statement with the fact that during this decade (say from 1877 to 1887) the population of Kansas City increased from 58,000 to 156,000, and that of Omaha from 25,000 to 110,000, and that not only these cities, but the whole Missouri Valley and the states of Kansas and Nebraska grew and waxed fat amazingly? What evidence has he save his naked assertion that this association restricted trade in the slightest degree?

"It is true that at periodical intervals quarrels arose among the parties to this pool, and that at such times there were periods when that 'natural competition' of which this witness thinks so highly had full sway, with the result every time of unsettling values, disarranging the plans of merchants and working general destruction. The reason for these disturbances were simply and solely that the pool was not legalized; because some (not all) of the courts held them to be void, and unenforceable by legal process, thus relegating them to the honor of the parties as their sole support. In the absence of legal construction of these contracts, what wonder that differences of opinion and of interest worked occasional disruption? Moreover, it is absolutely untrue that the rates were advanced under this pool. It may be true that advances were at times made on certain commodities, but far more rates were reduced, and the general average for the ten years will show a steady reduction. It is not claimed that the agreement worked perfectly, or that no discriminations existed, but it is a fact that they were far less common and far less demoralizing and disastrous alike to shipper and railroad than those that have existed since the passage of the interstate law.

"This witness quotes the opinion of various parties in opposition to the pool, but for every such opinion there can be produced ten in favor of it, not from the ranks of railroad officers, but from merchants and shippers, state and interstate commissioners, students of modern political economy, and, in fact, almost all those who have dispassionately studied the problems surrounding the transportation business of this country. It is well known that the chairman of the interstate commission favors pooling under proper restrictions, as a majority of the interstate commission does, and always has from its inception; so, also, I believe do a majority of the state commissions and a majority of the shippers of the country. The statement that the majority of the latter hold contrary opinions is pure assumption.

"The statement that rates in this country ever were or ever can be, too high per se, is absolutely without foundation. The service performed by American railroads is admittedly the cheapest in the world, as well as the best, and no pool, however, restrictive, can change the general laws of competition. No greater economic blunder can be committed than the fostering of free and unrestricted competition among carriers by rail—it tends to the aggrandizement of the few and the submerging of the many, and that portion of the interstate law which so unwisely prohibits pooling has done more to concentrate business in few hands and to drive out the small trader than could have been accomplished in a century of the old methods.

"One of the ablest of the interstate commissioners has said that the prohibition of pooling defeats the whole purpose of the law; that the law prescribes uniform rates, and forbids the only known plan by which rates can be kept uniform.

"The fact is that the commercial world does not accept, never has, and probably never will accept, the 'equal-rate' theory. That is just what the railroads want, but what the large shipper does not want; he will theorize that equal rates are best for all, but in his heart and in his practice he believes himself entitled to lower rates than his neighbor of less capital or less enterprise. Believing this he is actively engaged in finding ways to evade the law, and it would be surprising indeed if he failed to succeed. The law can no more be enforced than the prohibitory laws, which have so conspicuously failed. You may close the front door of the saloon, but those who are determined to get in will do so.

"But the underlying fallacy of all this talk about trusts and monopolies as applied to railroad pooling is the failure to differentiate between the railroad industry of the country and other purely commercial enterprises. The demand of the railroads, that they be permitted to charge reasonable rates—and nothing more has even been asked—is treated as if it were on a parity with a demand for the legalization of a trust in any article of merchandise. It is argued that to do this is to establish a dangerous precedent, apparently forgetful of the fact that this country has never assumed to dictate or to regulate the price of any commodity except railroad transportation, as to which it has assumed both by state and national laws to fix prices.

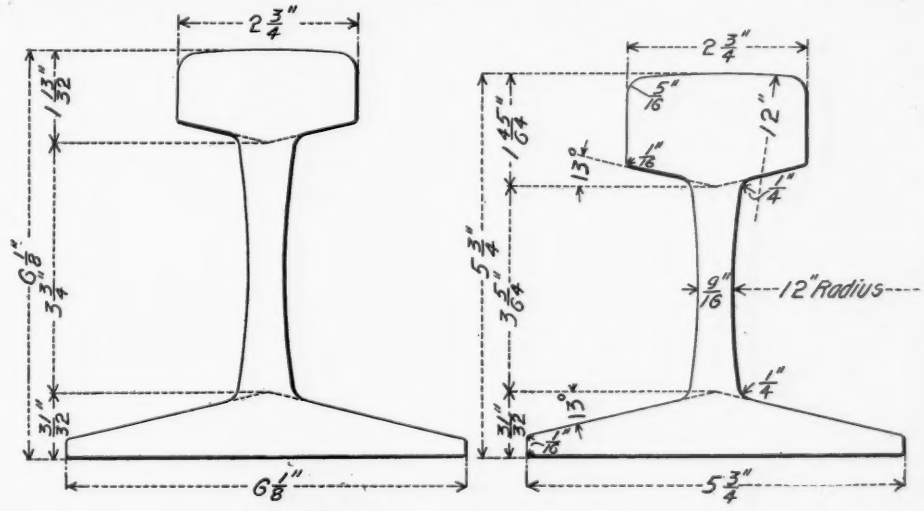
"It certainly would appear to a reasonably fair-minded man that when the supreme authority undertakes to limit the revenues of a private corporation it owes that corporation something in the way of protection. As matters now stand the railroads are limited in charges, forced to compete, and forbidden to combine for protection, though all the world may combine against them. It is considered legitimate and praiseworthy for the employees of railroads to combine to force up wages, and a crime for the railroad to combine to maintain the rates which the government holds to be reasonable. Could injustice go further? No such restrictions are put upon any other business in this country, and no such restrictions are imposed upon railroads in any other country.

"To ask for permission to pool earnings is a very modest request under the circumstances; the roads might well ask for more, as, for instance, laws prohibiting the building of unnecessary roads and confirming each existing line in the sole occupancy of its territory.

"Such laws exist in other countries, and are wholly reasonable and proper if the railroad is to be considered as a public or 'quasi-public' institution. In short, the whole attitude of the American people toward the railroad industry is inconsistent and dishonest; railroads are considered as public institutions to the extent that their users are to limit their rates, but their owners are to pay their bills. They are taxed more heavily than any other interest, and accorded nothing in return except the so-called 'right of eminent domain,' which, being interpreted, means that they can force a man to sell his land at two or three times its value; and even this is nothing for which they have to thank the public, since it is a necessary concomitant to the building of railroads, which the public must have.

"To conclude: The permission to pool is asked for, not as a favor, but as a right—as being not a cure-all, but as the best-known remedy for discrimination as between individuals and localities, which is to-day and always has been the worst and practically the only evil with which the American railroad system can be charged, either as to present or past practice. It is an evil which can never be removed by laws, however drastic, but which can be largely done away with by removing all incentive to it.

"Let the government do one of three things, namely: First, remove all restrictions and turn the railroads



100-lb. Rail Sections Am. Soc. C. E. and Suggested.

loose. Second, accord them that protection to which they are justly entitled. Third, buy them.

"The railroads are entitled in all fairness and justice to ask that one of these three courses be pursued. The present mixture of all the objectionable features of the three is unjust to the last degree."

Electro-Pneumatic Interlocking at the Boston Southern Station.

[WITH AN INSET.]

By J. P. Coleman.

(*Continued from page 777.*)

Switch Mechanisms.

Switches require for their operation by fluid pressure, double-acting cylinders, since they do not employ gravity to move them or to hold them in one of their positions, as do signals. These cylinders have, in addition to moving the switch, to move their detector bars and locks, also. For this reason they are not directly connected to the switches, but are adapted to give to switch-and-lock movements the motion necessary to perform these three duties. Simple switches ordinarily present a comparatively uniform and constant load to their operating cylinders. The chief variation depends on whether single or double detector bars are used on the switch. Bars to be serviceable in pneumatic interlocking must be of substantial construction, and are preferably ½ in. thick. Where a switch has two such bars, each 45 ft. long, the bars are the chief part of the load.

During sleet and snow storms the resistance offered by the adhesion of these bars to the rails increases greatly the work to be performed by the cylinder, and to meet this condition a temporary increase of air pressure is sometimes resorted to. A double slip switch with (or without) movable frogs is worked by two cylinders—one at each end. When movable frogs are used, they are operated by means of one of these cylinders, which is, in consequence, made larger in diameter than would otherwise be required. In mechanical interlocking much prejudice exists against the use of switch and lock movements, owing to the small portion of the movement's stroke that is available for locking the switch. On long mechanical leads a failure to give to the movement this last portion of its stroke, used for locking the switch, is not readily detected, and the lever in several instances has been forced home without effecting the locking of the switch, which had not properly shifted. Disastrous results followed.

In this electro-pneumatic system, however, this objection does not hold good, since this system comprises in its switch operating mechanism a detector or indication device that compels a full movement and locking of each switch in response to a partial movement of its lever and before the complete movement of the latter can be effected. This device will be described in connection with the interlocking machine, as its chief mechanism is attached to the switch levers thereof. Its control, however, is effected by two pairs of electric contacts mounted in a box, which is attached to the switch movement. These contacts are closed alternately at the extreme ends of the movement's stroke, after the locking of the switch is performed in each position, and each pair of contacts is separably connected with the interlocking machine.

When several movements are joined in series, as in the case of double slips with movable frogs, the "indication box" is mounted upon the movement farthest from the operating cylinder, so that in the event of a rupture of the operating connection no false indication may occur. Detector bars, where many slip switches are used, extend, as a rule, from switch points back toward their frogs, and are preferably operated through a rocker shaft interposed between them and the switch movement. Where movable frogs are used, this shaft is indispensable to the operation of the bars protecting them. Economy of track room on sidings and on other tracks used for storage purposes frequently necessitates the placing of two bars back of switch points where a single bar ahead of the points would otherwise suffice for their protection.

Bars protecting the switches of crossovers, when located behind the switch points, avoid the inconvenience and delay that occasionally result from bars ahead of points, since this method permits of the immediate operation of switches the instant they are cleared by trains. The retention of a crossover in its reverse position by action of a train that has passed over and clear of its switches and of the fouling points of the adjacent track, must necessarily interfere with all movements on that track, and this at times when those movements could be made with entire safety under the more advantageous arrangement of bars.

The convenient and substantial support of detector bars of double slip switches and movable frogs has been a problem for some time. The narrow spaces in which clips and links have to be placed, in the Boston interlocking, renders their application difficult, and their quick renewal and repair would be impossible in many instances were those of the ordinary design used. Clips and links of the usual form must be so fixed with reference to adjacent rails that sufficient space is left between those rails and the ends of the clip studs so that the links may be slipped off the studs readily. This space must be equal to the thickness of the hub of the link.

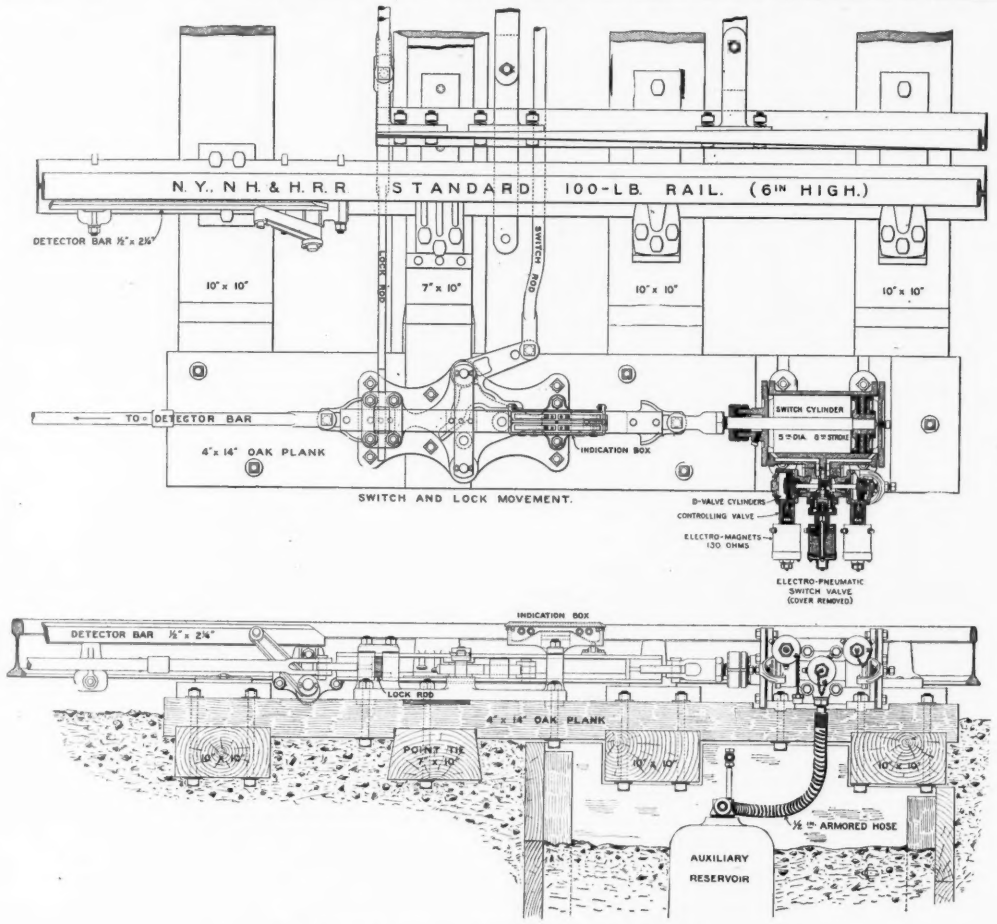
In the improved clip and link used at Boston the lower half of the link's bearing upon the stud is cut away, and the support ordinarily given by this portion of the link is now given by a semi-circular collar formed thereon that projects into a corresponding recess in the clip. (See Fig. 4a.) This projection is but ⅜ in., hence by removing the outer washer, which secures the link as usual upon the stud, the ling need be moved but ⅜ in. outward upon the stud to detach it vertically from the clip. These clips may be placed with their stud ends actually against adjacent rails without preventing the removal of their links. Over 4,000 of these clips and links are now in use at the Boston Station, 2,00 of which have stood the test of ten months' service with practically no wear or breakage, and with a frequency of operation that proves the test an effective one.

The front rods of the No. 8 double slip switches are provided with the New York, New Haven & Hartford standard intermediate point separators, a device not applicable to the No. 6 slips owing to the extension of the points in those slips so far toward the frog as to give insufficient distance between them for its application. (See Fig. 10.)

Where movable frogs are operated in connection with one end of a slip switch, and both from a single cylinder, the detector bars protecting both are operated from a single shaft, the operating arm of which is placed directly in the line of connection between frog and the slip movements. Although an extremely simple arrangement and one that insures the least lost motion in bar connections, this method would prove a detriment to the operation of the slip and frog points without the bars, should an accident damage the latter so as to render them inoperative and at the same time difficult of disconnection from the shaft, if not for a noteworthy feature of the arm and its mounting on the shaft.

This arm is in effect a "radial" arm employing a collar on the shaft as a bearing upon which it may turn independently of the shaft when disconnected from a similar arm secured to the shaft. This fixed arm and the loose or radial arm are bolted together so as to operate as one normally, but by removing the bolt the shaft is in effect disconnected from the operating connection and the loose arm serves only as a guide to the latter.

A switch cylinder has to do a greater amount of work than a signal cylinder, and it must be done in the least possible time. The electro-pneumatic pin valve of the signal cylinder is, by reason of its small



Figs. 1 and 2.—Plan and Elevation of Simple Switch.

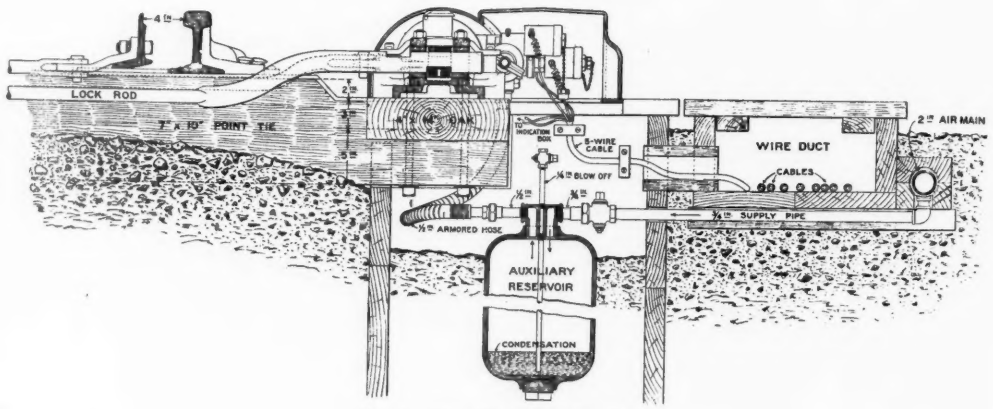


Fig. 4.—Cross Section of Fig. 1.

tower at all times. If this current should cease to influence the magnet (from accident to its generator or conductor) the failure would simply cause the air to be discharged from behind that one of the pistons that last shifted the slide valve, but would not cause this valve to be shifted. It is possible, however, to conceive of this happening in conjunction with a cross between the conductor of the opposite valve

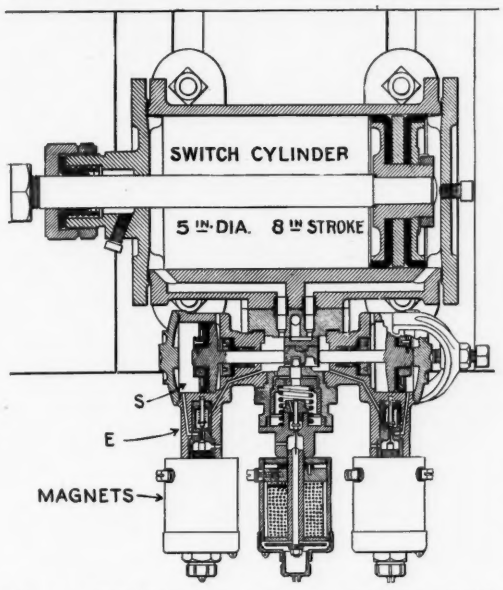


Fig. 3.—Large-Scale View of Electro-Pneumatic Switch, Cylinder and Valve shown in Fig. 1. (Cover of Valve Removed.)

REFERENCES: *S, D-Valve Cylinder; E, Controlling Valve.*

magnet and some other conductor carrying at the time a current of sufficient potential to penetrate the insulation of both, these insulations being sufficiently defective to permit of ample current passing from the "live" conductor to that of the valve magnet to excite the latter and shift its pin valve. In the event of such a combination of conditions and circumstances the slide valve, if not otherwise restrained from action, would be shifted and the switch would assume a false position with respect to its lever.

Remote as would be the probability of such an occurrence, the introduction of a pneumatic bolt lock to the slide valve in the design of switch valve employed, and the compulsory withdrawal of this lock previous to each attempt to operate the valve that follows this introduction, render false operations of the switch practically impossible. This is true even where the system is grossly neglected in the matter of inspection and maintenance and when operating in close proximity to trolley lines and other conductors carrying circuits of vastly greater potentials and volume than those employed to shift the valves, as is demonstrated in a number of practical applications.

This bolt lock consists of a balanced piston, the plunger of which is normally forced into a recess in the slide valve by the action of a stout coil spring within the cylinder. The air pressure is normally confined to the cylinder (above and below the piston) by a simple pin valve controlled by an electro-magnet. When the magnet is energized the pin valve is operated to exhaust the air from above the piston; its escape permits the pressure confined beneath the piston to elevate the latter and to compress the coil spring, at the same time withdrawing the slide valve lock, whereupon the slide valve may be shifted.

To de-energize the electro-magnet is to shut off further escape of air from above the lock piston, which is at once forced to again lock the slide valve by the action of the spring above it—the pressure above the piston gradually rising to equalize that below it. This it does through an extremely small hole drilled through the piston and through the loosely fitted metal packing of the latter.

A description of the interlocking machine controlling these devices and of the means by which their operation and control is accomplished, will form the subject of a later article.

In connection with the description published in this issue we give, on the inset, a number of views of the station proper, made from photographs. These photographs were taken some time ago, but they are in some respects superior to most of the illustrations heretofore published, and for that reason seem worth placing on record. It should be noted, however, that Fig. 5, showing the platform in the lower level of the station, gives a very inadequate idea of the appearance of the room. The walls are of white enamelled brick and every part of the very large space devoted to passengers is made light and cheerful by electric lamps. This part of the station is not yet in service and, in fact, the directors of the New York, New Haven & Hartford have not yet decided upon a smokeless motive power; and such decision will have to be made before trains can be run into the underground station.

In the "midway," the space on the main floor between the waiting room and the train shed, which is shown in Fig. 7, three pavilions have been put up since our view was taken. One of these is for the sale of newspapers, one for cigars and one is a waiting room for persons who come to meet incoming trains.

The interior of the main waiting room, Fig. 8, was photographed just after the opening exercises and before the speaker's platform had been taken out. In this room there is now a kiosk, used as a florist's stand. This photograph was taken by daylight, but the electric lights were turned on to improve the effect.

The general plan of this station was published in the Railroad Gazette of Jan. 1, 1897, and the principal description was published Jan. 6, 1899.

Electricity or Steam for Branch Line.

It will perhaps be remembered that at the Cape May convention of the American Society of Civil Engineers Col. H. S. Haines proposed the above topic for discussion. Some report of the discussion, then and later, has appeared in these columns, and it may be found in full in the Proceedings of the Society. In the November issue of the Proceedings, just out, Mr. C. H. Davis treats the topic at great length. We cannot even summarize his elaborate analysis, but give his conclusions:

Reversing the usual order, some of the writer's conclusions are given prior to the discussion, in order that each step may be followed more readily. The figures and tables may be found to have some errors and, in many cases, are only approximate.

Conclusions.

(1) Steam railroads will, in the near future, handle

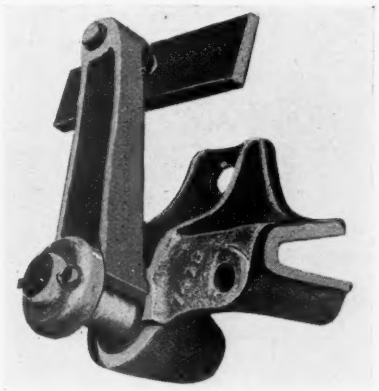


Fig 4a —Detector-Bar Clip.

their suburban and short-distance interurban passenger traffic and mail, express, baggage and light local freight carried in said suburban and interurban passenger trains, by electric motive power; and this, irrespective of whether operating expenses are affected favorably or unfavorably.

(2) Steam railroads will not, in the near future, handle their freight traffic (other than mail, express, baggage and light local freight carried in suburban and interurban passenger trains), and long-distance passenger traffic by any other motive power than steam locomotives.

(3) Steam railroads may, under exceptional conditions of large volume and great density of passenger traffic over comparatively short distances, handle it by electric motive power, but such cases will be infrequent.

(4) New railroad lines, connecting very large centers of population, where frequent service at much higher speeds than can be attained now by steam locomotives on existing lines are conditions of success, will be operated by electric motors.

There are three conditions under which suburban and short-distance interurban traffic will be handled profitably by steam railroads converting to electric traction:

1. (a) Where units can be light and frequent, and operated over comparatively short distances.

(b) Where gross receipts can be so increased by the change of system and mode of operation as to pay for the increased investment and possible increase in operating expenses.

(c) Where competition of parallel electric roads compels the change, to save what traffic there is, irrespective of how operating expenses are affected.

In the future development of steam railroad systems they will eventually be operated jointly with surface electric railways, either through actual mutual ownership, or by traffic contracts, leases, etc.

The above conclusions are obviously dependent upon what Mr. Prout properly defines as "traffic conditions," and not primarily engineering details or operating expenses.

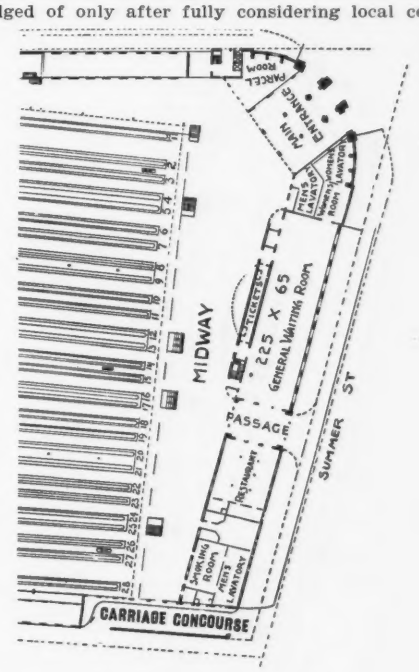
Is Your Excursion Business Profitable?

The report of the Committee on Excursion Business, which was presented at the recent meeting of the General Passenger and Ticket Agents, at Boston, deserves more than a passing notice, though the convention took no action of consequence on it. The members of the committee are Messrs. P. S. Eustis, F. E. Boothby, J. Francis, C. E. Harman and O. H. Taylor. The report indicates a decided conviction on the part of the majority of the committee, and apparently on the part of the whole, that reductions in rates for excursions are often made with too little care and might, in many cases, be so arranged as to produce more satisfactory revenue, while still giving the public reasonable accommodation.

The report deals with four classes of excursion business: (1) Small conventions, (2) large conventions, (3) national conventions, such as the Christian Endeavor and the G. A. R., (4) local excursions which have to be "worked up." The committee believes it impossible to formulate any rules for general application, but it is suggested that each territorial association establish a small committee to study the excursion business. In considering the first class it is noted that at 581 small conventions dealt with by the Western Passenger Association in 1898, 261 failed to take advantage of the reduction because the attendance was less than 100; and more than half the others had less than 125 people. It is questionable whether it would not have been better to refuse the reduction to the smaller gatherings. Would not the attendance have been much the same without a reduction? This condition is found to exist all over the country. Of course, these reductions, being confined to delegates, do not interfere much with regular traffic.

The second class embraces conventions where reductions are not confined to delegates and certificates are not required. The Western Passenger Association had 227 of these in 1898. A study of these cases leads to the conclusion that at many of these the reduction should not have been made. Frequently a reduction of one-third does not increase the travel 50 per cent., and a reduction of 50 per cent. does not double the attendance. Where such a reduction is made to an important center it is availed of by travelers who would otherwise have paid regular fare. Reductions of this class should never be made so low as one fare for the round trip; that is too great an encouragement to scalpers. The third class of reductions often diminishes regular business for a considerable time before and after the limited dates, as people postpone their journeys to take advantage of the reduction. The interference with freight trains is often serious and expensive when these excursions are run, and it is doubtful whether they are profitable for distances greater than 200 miles. These very large excursions can be made profitable by making certain reforms; but the committee doubts whether these reduced rates should ever be granted to persons riding in sleeping cars; the reduction should be confined to big trainloads of passengers in coaches.

The fourth class is peculiarly one which can be judged of only after fully considering local condi-



Boston Terminal Station.

tions. Where there is a great "attraction" a slight reduction will often fill all your cars, and of course in such a case the reduction should not be a big one. Even where it is necessary to make a considerable reduction to fill your cars, it should be remembered that there is a normal limit to the average passenger's pocket; where the fare exceeds $2.50 there is little business to be had, no matter how great the distance. Where there is little attraction, as at the

seashore or a picnic ground, more radical reductions may be necessary. Free transportation to committees, and especially for a few bands, will help much in this class.

The committee adds to its report a letter from Mr. George S. Marsh, of the Chicago, Milwaukee & St. Paul, describing his excursion business. Mr. Marsh has made many experiments with excursions of the fourth class. He has an excursion agent who "promotes" that kind of business all the time. Mr. Marsh believes $2.50 to be the highest practicable rate for one-day excursions, and thinks that in many cases where he has charged this rate he could have secured more profit by making it 50 cents less. He plans large excursions from six to twelve months in advance and gives the operating department ample time to move cars to the required points without extra locomotive mileage. An excursion of this kind should not be run unless it is reasonably sure to earn $1 per train mile, and usually $1.25 is the lowest reasonable limit, as the actual expense usually figures out at least 90 cents. Dead-head engine mileage necessary for these trains should be estimated at about 50 to 75 cents a mile. Mr. Marsh makes an important feature of furnishing entertainment for the passengers. At Sioux City, Ia., June 18, he ran nine special trains from different places and furnished the passengers with 1,300 watermelons; but he does not say whether he gave these out free or made a profit on them. He ordered them in Florida and got them to destination one day before they were needed. This excursion earned $2.75 per train mile net. The company controls a tent capable of seating 5,000 people, which is used when necessary, and which often helps to draw people who otherwise would stay at home on account of liability to get caught in the rain. Baseball clubs, lecturers, phonograph men, men who go up in balloons, etc., are engaged some time in advance, often six months, and these are transported free. For Sunday excursions Talmage, Sam Jones and Ingersoll have been engaged to lecture. (Who will take Ingersoll's place is not stated.)

On one excursion, Sept. 3, to Chamberlain, S. D., one train was run with four sleeping cars, the charge having been $4 for each berth for the round trip. Most of the berths were used by two persons. This train had a lunch car to serve breakfast to the passengers. This excursion, which gathered people at places near Chamberlain, as well as those farther off, was patronized by 4,500 people and earned $9,500.

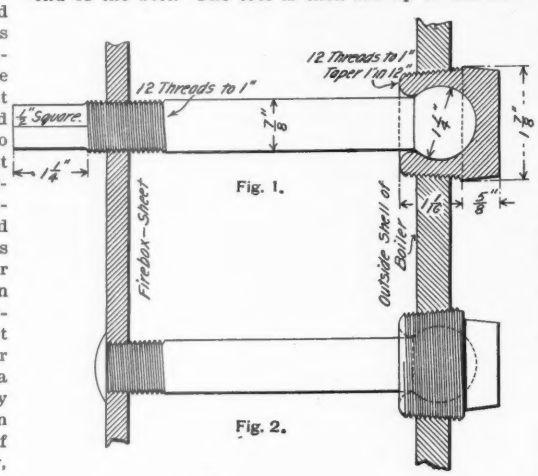
Flexible Locomotive Stay Bolts—Mexican Central Ry.

Mr. F. W. Johnstone, Superintendent of Motive Power & Machinery of the Mexican Central, has recently given much attention to improved methods of staying locomotive boilers and has devised the flexible stay bolt shown by the accompanying engravings with a view to reducing the cost of renewals and the liability of explosions caused by broken bolts. Attention was called to this matter by the large number of broken stay bolts, reported each month by the boiler inspector, on locomotives carrying high steam pressures. For instance, during the three months of August, September and October last, 1,114 broken stay bolts were renewed in a lot of nine locomotives running in a bad water district. These locomotives carry 180 lbs. steam pressure and all were put in service since the spring of 1897. They were built in the United States by one of the best locomotive builders and the best grades of stay bolt iron were used. The stay bolts were ⅞ and 1 in. in diameter and spaced with 4-in. centers. The locomotives were inspected every 30 days and all broken bolth renewed immediately after inspection. While the greater number of these breakages were easily accessible and could be renewed at a moderate cost, in some cases they were so located as to require the removal of other parts, such as the air pump, reverse lever quadrant, springs and spring rigging, and the cost in such cases of replacing one bolt might be several dollars; and when the loss of service of the locomotive was taken into account the renewal of stay bolts became an important item. By far the largest number of broken stay bolts was found in the upper corners, front and back, and as all these bolts were broken off next to the outer sheet it is believed that the use of a flexible stay bolt will overcome these failures.

The stay bolt designed by Mr. Johnstone consists of two pieces, one being the bolt proper with a thread cut on one end and a spherical head formed on the other. The second piece is a plug, closed down around the spherical head and screwed into the outer sheet. Fig. 1 shows the cross-section of this plug, and also shows the stay bolt screwed into the firebox sheet ready to be cut off and hammered over; the bolt as finished being shown in Fig. 2. Fig. 3 is the drop forging, made of mild steel, as it comes from the dies and before being closed down around the spherical head of the bolt.

In the Mexican Central shops these plugs are forged under a steam hammer. Pieces 1¾ in. long are cut from 1¾ in. round steel and are put in a steel die. A punch, working in a suitable guide, is placed over the die and one moderate blow of the hammer shapes the plug as shown in Fig. 3. At present the plugs are closed down over the spherical heads by hand, but a machine is now being designed to do that work, which will materially reduce the cost.

The spherical head on the bolt is formed in an up-setting machine and comes out about $\frac{1}{16}$ in. larger in diameter than the finished state. The bolt is then put into a chuck on a small lathe with the spherical end projecting from the chuck. This lathe is fitted with a tool post swinging around a center directly beneath the center of the ball on the end of the bolt. The tool is then fed up to the ball



Johnstone Flexible Stay Bolt

until it strikes a stop, which determines the diameter of the ball, and the tool is moved around the ball by a hand lever, giving the desired form. This lathe is run by an apprentice boy and the cost of turning the heads is less than ¼ cent each, Mexican money. As the thread on the bolt is entirely independent of the thread on the plug, the stay bolt is threaded in an ordinary bolt cutter.

In applying these stay bolts, when making renewals, the hole in the outer sheet is drilled out to the proper size for the plug, when it is tapped by means of a hollow tap; a rod is used passing through the tap and through the hole in the firebox sheet to insure tapping the hole in the outer sheet in line with the hole in the inner sheet. The hole in the firebox sheet is then tapped with an ordinary stay bolt tap, and when found necessary this is kept central with the outer hole by using a thimble over the stem of the tap to center it in the outer hole. It will be seen that there is no necessity for the holes in the two sheets being tapped in unison with each other, as the stay bolt is free to revolve in the plug.

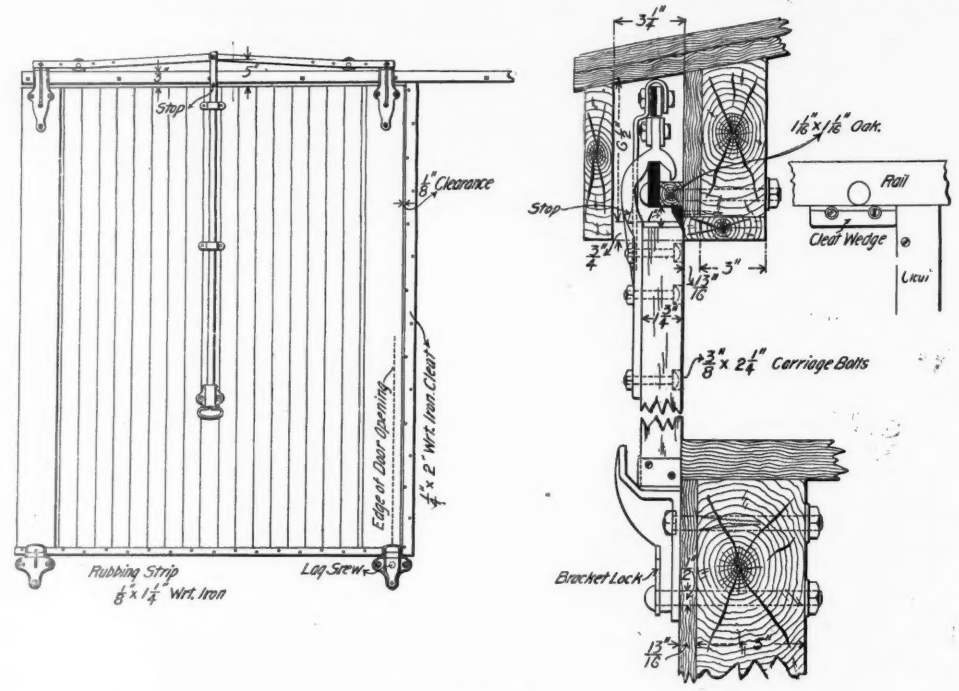
When the flexible stay bolts are put in, one man is on the outside and one is inside the firebox. The stay bolts are made of such length that the square on the end projects into the firebox before the plug enters the outer sheet, and the man inside turns the bolt by means of the square head and the man outside enters the plug, the two being screwed in together. After the end of the bolt is cut off inside the firebox, a holding-on bar is held against the back of the plug while the bolt is riveted over in the usual way.

Repeated tests of these stay bolts have been made to determine their ultimate strength against the bolt pulling out of the plug. Where the plug is screwed in so that a vertical line through the center of the head is entirely outside the sheet, it has been found that more than 20,000 lbs. is required to pull the bolt out of the plug; and where the plug is reinforced by the sheet, about as shown in Fig. 1, the bolt breaks under a pull of from 28,000 to 30,000 lbs., before the spherical head even becomes loosened in the plug. This represents about ten times the load which is brought on the bolts in actual service, where they are spaced 4 in. center to center with 180 lbs. steam pressure, and would indicate that the construction has ample strength. As these stay bolts have been used but a short time, of course no data is now available as to the results of service trials. Mr. Johnstone is now applying these flexible staybolts in all cases of breakages in and above the row of bolts where the side sheet is curved.

The Jones Car Door.

The accompanying engravings show the details of a freight car door made by the Jones Car Door Company, Chicago, and designed to be outside hung, while having many of the good features of a flush door. That is, when closed, the door wedges against the car at the top and bottom, and at the sides it is held between the front stop and a permanent wrought iron cleat at the rear. The operating apparatus is a modification of that used for a number of years with the "Moore" car door.

The rail is a wrought iron piece, ½ x 2 in., set 1 $\frac{1}{16}$ in. from the side of the car, to which it is bolted in the usual way. Just below the filling piece and opposite the hanger straps, when the door is closed, are placed cleat wedges or guides, which engage brackets on the hanger castings; this construction is clearly shown in the sectional view. It will be seen that as the door is raised it is moved out by the wedge cleats, and when lowered the inclined surfaces of the hangers and lower brackets cause it to move in against the car. The door is raised by pulling downward on the operating handle, which through the levers above the door transfers the weight from the hanger straps to the wheels, in which position it is free to move; whenever the handle is released the weight is again taken by the straps and lower brackets, wedging the door against the car in any position it may happen to be. One of the principal advantages claimed is that the door



The Jones Car Door.

is carried on the rollers only when it is being moved and at other times it is held stationary. It may also be noted that a stop on the vertical operating strip limits the movement of the operating handle to 2 in. The usual wooden stop is used at the front of the door and a ¼ x 2 in. wrought iron strip is screwed to the car at the rear, taking the place of temporary cleating, and closing the opening along that edge.

The bracket at the corner of the door opposite the seal is made so that it cannot be removed when the door is in place; this is to prevent the car being entered without breaking the seal, or the door fix-

tures. This bracket, as shown in the sectional view, is fastened to the car by two side bolts and a central lag screw; then the lock, which is a flat plate with the upper end enlarged, is dropped through an opening in the shelf of the bracket covering the head of the lag screw. The lower bolt passes through both the lock plate and bracket, and as the door is always over the lock when in place, it is not possible to reach the lag screw and so remove the bracket. On ventilated fruit cars one of these brackets is used at each corner of the opening, but on box cars one lock bracket is required. All the castings used are malleable iron and the operating levers are steel.

Schenectady Ten-Wheelers for the Northern Pacific.

The Northern Pacific has lately received from the Schenectady Locomotive Works 14 10-wheel freight engines which are of the same general type as engines built for the same company late in 1897 and early in 1898, and described by us Jan. 14, 1898. These later engines carry 8,000 lbs. more on the drivers and are about 1,000 lbs. heavier, total. The cylinders are the same diameter but the stroke is 2 inches longer.

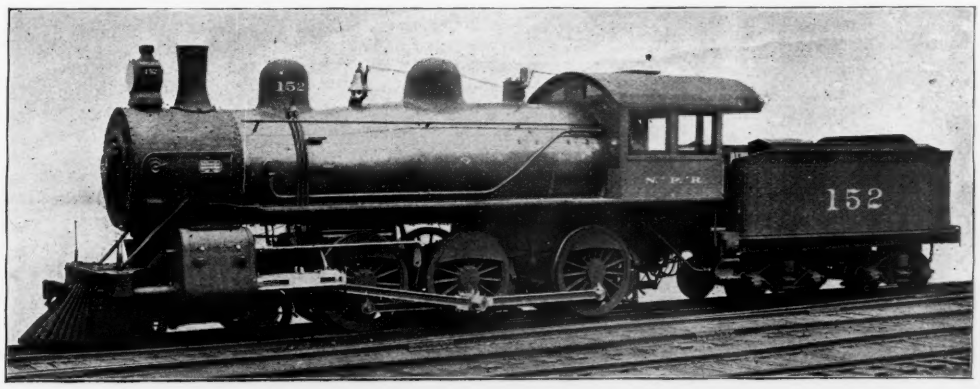
The heating surface is 117 sq. ft. more. They are two-cylinder compounds and have a piston valve on the high-pressure side. It is said that the ease of handling and the lessened strain on the valve gear are quite notable, as compared with the slide valve. These engines have the firebox depressed at the front to give as much depth as possible under the tubes, and it will be observed that they have a very large heating surface, namely, 3,012.7 sq. ft. The grate area is 34.22 sq. ft. The springs are underhung. These engines are said to be giving good economy in fuel and repairs in very severe service.

Ten-Wheel Compound Freight Engines—Northern Pacific.

Weight in working order	175,500 lbs.
" on drivers	134,200 lbs.
Wheel base, driving	14 ft. 10 in.
" " total	26 ft. 8 in.

Cylinders.

Diameter of cylinders	22 in. x 34 in.
Stroke of piston	30 in.



Schenectady Ten-Wheeler for the Northern Pacific.

Horizontal thickness of piston	5¾ in. x 4⅛ in.
Diameter of piston rod	3¾ in.
Kind " " packing	Ring 1 in. deep L. P.
" " " rod packing	Jerome
Size of steam ports	23 in. x 2⅛ in.
" " exhaust "	23 in. x 3 in.
" " bridges	1⅜ in.

Valves.

Kind of slide valves	H. P. piston valve, L. P. Allen-American
Greatest travel of slide valves	6½ in.
Outside lap " " "	H. P. 1¼ in.
Inside " " " "	Clearance ¼ in.
Kind of valve stem packing	Jerome

Wheels, Etc.

Diameter of driving wheels outside of tire	63 in.
Material " " " centers	Cast steel
Tire held by	Shrinkage
Driving box material	Cast steel
Diam. and length of driving journals	9 in. dia. x 11 in.
" " " " main crank pin journals (main side 7 in. x 5¼ in.)	6½ in. dia. x 6 in.
" " " " side rod crank pin journals	F. & B. 5½ in. dia. x 4½ in.
Engine truck, kind	4-wheel swing bolster
" " journals	6 in. dia. x 11 in.
Diam. of engine truck wheels	30 in.
Kind " " " "	Steel tired

Boiler.

Style	Extended wagon top
Outside diam. of first ring	70 in.
Working pressure	200 lbs.
Material of barrel and outside of firebox	Steel
Thickness of plates in barrel and outside of firebox	5/16 in., ⅜ in. and ½ in.
Horizontal seams	Butt joint sextuple riveted, with welt strips inside and outside
Circumferential seams	Double riveted
Firebox, length	120 3/16 in.
" width	41 in.
" depth	F. 84 in., B. 71½ in.
" material	Carbon steel
" plates, thickness	sides 5/16 in., back 5/16 in., crown ⅜ in., tube sheet ½ in.
" water space	front 4½ in., sides 3½ in. to 4 in., back 3½ in. to 4½ in.
" crown staying	Radial 1⅛ in. diam.
" stay bolts	1 in. diam.
Tubes, material	Charcoal iron No. 12
" number of	376
" diameter	2 in.
" length over tube sheets	14 ft. 2 in.
Fire brick, supported on	Water tubes No. 8 Allison 3 in.
Heating surface, tubes	2,772.6 sq. ft.
" " water tubes	32.1 sq. ft.
" " firebox	208.0 sq. ft.
" " total	3,012.7 sq. ft.
Grate surface	34.22 sq. ft.
" style	Rocking Ry. Co.'s style of bar, openings ⅝ in. and 11/16 in.
Ash pan, style	Hopper, dampers front and back
Exhaust pipes	Ordinary
" nozzles	5¼ in., 5½ in., 5¾ in. diam.
Smoke stack, inside diameter	18⅜ in. at top, 16 in. near bottom
" " top above rail	14 ft. 10½ in.
Boiler supplied by Hancock insp. type "A," size No. 10 R. S. Ohio lever handled st'd. A size No. 10 L. S.	

Tender.

Weight, empty	37,800 lbs.
Wheels, number of	8
" diameter	33 in.
Journals, " and length	4½ in. dia. x 8 in.
Wheel base	15 ft. 3 in.
Tender frame	10 in. channel
" trucks	2 trucks 4-wheel, side bearings on both trucks
Water capacity	4,350 U. S. gal.
Coal "	9 (2,000 lbs.) tons
Total wheel base of engine and tender	53 ft. 6½ in.

American brake on all drivers, operated by air.
Westinghouse automatic air brake on tender and for train; 9½ in. air pump
Two 3 in. Ashton safety valves.
Leach sand feeding apparatus.

The East River Tunnel of the Long Island Railroad.

The project for building the East River Tunnel of the Long Island Railroad appears to rest just where it did ten or more months ago, when the plans were practically completed, the money underwritten and the railroad ready to go ahead with the work. The project waits for the Municipal Assembly to grant the necessary rights. Not only are the Long Island Railroad blocked in the matter of the proposed extensive improvements and the people of Long Island put to inconveniences, but Brooklyn itself is prevented from making important improvements on Atlantic Avenue jointly with the railroad. Those who have kept informed will remember that the Atlantic Avenue improvements (which provide, in part, for laying the present tracks of the Long Island Railroad underground on that avenue) can not be carried out until the railroad is ready to proceed; and the road, of course, is not willing to spend $1,250,000 on this work without the right to proceed with the tunnel, which is an important part of its plan for giving better and quicker service between the down-town section of New York City and the cities and towns on Long Island through which the railroad runs. The fact that these betterments will relieve somewhat the crush on the Brooklyn Bridge during the heavy hours ought to be reason enough to cause immediate and favorable action to be taken and the work to be urged along as rapidly as possible. The subject has been pretty carefully discussed and the plans given in the Railroad Gazette for the current year on Jan. 27, March 10 and May 5 and 12.

Chicago Drainage Channel.

Two important documents relating to the Chicago Drainage Channel were made public last week. The first was a report to the Sanitary District Trustees by Mr. T. T. Johnston, the District's Consulting Hydraulic Engineer, and the other was the preliminary report of the State Commission, of which Mr. Desmond Fitzgerald is the Chief Engineer.

Mr. Johnston discussed the various questions liable to be raised by the State Commission. Briefly, he claimed that with the completion of the Channel disastrous floods in the Des Plaines River, such as those of 1849 and 1892, could not occur; with the lowering of the tunnels navigation in the Chicago River would be greatly improved; that the River will have a capacity for flow in excess of 300,000 cu. ft. per minute, and this flow will be attained with a velocity of one mile an hour in most places, while at two bridges the current will be about two miles an hour for short distances. It is held that these velocities will not seriously affect navigation.

The State Commission in its report placed the population of the Sanitary District at 1,800,000, which, under the law, would call for a minimum flow of 360,000 cu. ft., but it is found that the Chicago River and the Channel, when completed, can take care of that flow without creating a current of more than three miles an hour, the maximum velocity which the law provides. The following extracts give some of the findings of the Committee:

1. That the main channel when freed from all obstructions existing in said channel (occasioned by the sanitary trustees not having completed their work in the channel) will more than fully meet the requirements of the law, namely, a depth of 14 ft. in the alluvial part and 18 ft. in the rock portion of the channel, and will have the size and capacity for carrying the amount of water required by the special commission under the act—namely, 360,000 cu. ft. of water per minute in the alluvial and 600,000 cu. ft. of water per minute in the rocky portion at a current not to exceed three miles per hour.

2. The Chicago River, with the dredging and the improvements, will have the capacity of carrying the amount of 360,000 cu. ft. of water per minute at a current not to exceed three miles per hour.

As to the unfinished work, our commission calls attention to a detailed report by its Chief Engineer of work to be done before a final report can be submitted to the Governor.

The Railroads and the Farmers.*

By W. M. Acworth, Barrister-at-Law.

I will begin with a statement which I am convinced most of my hearers will refuse to believe, that English railroad rates for the conveyance of agricultural produce are not excessive. I will go so far as to say that, compared with the rates in force in other countries for similar quantities of similar articles under similar conditions, they are low rather than high. I give this as an opinion based on a study both practical and statistical of the conditions in this and other countries which has extended now over a good many years. In the case of railroad rates, where the tariffs of different countries are constructed on different bases, deal with different average quantities, carried for different average distances, and under absolutely different conditions, figures may in the hands of a manipulator who knows the very rudiments of his business be made with consummate ease to prove anything he wants them to prove.

Let me give you one instance of English railroad rates. For the sum of 4d. the Great Eastern Railway will bring from any part of its district, say an average distance of 80 or 100 miles, into London, and deliver free to the consumer's door, a box weighing up to 20 lbs. Such a box will hold, for instance, a pair of ducks, a couple of pigeons, a dozen eggs, 2 lbs. of butter, and leave room to fill up with trimmings in the shape of sausages, tomatoes, flowers, or anything the grower may have handy. The minimum value of the contents can hardly be put lower than 10s. to 12s. It will surely not be said that 4d. out of 12s. is an excessive amount to pay for carriage. Look at the matter from the railroad point of view. The minimum charge made by the local parcels delivery companies in London is 4d.; and I am assured by a friend of great experience that 3d. is a moderate estimate of the actual minimum cost of delivering a parcel by a railroad cart. This leaves the company 1d. for receiving the parcel at the country station, carrying it by train 100 miles, transferring it at the London terminus and keeping the accounts of the whole transaction. . . . It would not be fair to suggest that these extraordinarily low Great Eastern rates are typical of those in force all over the country. . . . But I recently had the opportunity of comparing the rates for farm produce now existing on one of our great lines with those that were in force three years back. These reductions range from 10 to 20, and in many cases to 30, 35, and even 40 per cent. I have no reason to believe that the case of this particular company is in any way exceptional.

On the whole, I believe a fair statement of the case is somewhat as follows. The rates in England for the carriage of small consignments of perishable produce are at least as low as those in force in France, Germany, or America; having regard to the speed and general convenience of service, they might even be said to be lower. At the same time agriculturists in foreign countries do get a great deal of their produce carried at less than English rates, because they send it in quantities and under conditions which English agriculturists refuse to accept. If, however, English farmers will consent to adopt foreign methods, English railway companies have already shown themselves ready to concede them in return foreign terms. In a word, English agriculturists send their produce in retail quantities at rates which for retail quantities are low. Foreigners send wholesale at rates naturally much lower.

I turn to another point. Thanks not to the railroad companies, but to English geography, our rates are less burdensome than the foreigners' for another reason. In America production and consumption are separated almost by thousands of miles; even on the Continent, Paris and Berlin draw their supplies from the farthest corners of the country. In this small and thickly populated island the average distance produce is carried can hardly, except in the southwest of England, amount to more than 50 miles. Now it needs no argument to show that if an American farmer, though paying only ¼d. per ton per mile, has to pay that farthing for each of 500 miles, the railroad rate presses more severely on

* From the Transactions of the Surveyor's Institution, London.

him that it does on an English farmer who only sends 50 miles, even though he may pay 1½d. per mile.

It is hardly, I think, generally appreciated how small a proportion railroad rates bear to the total cost of ordinary articles of consumption. Meat is worth say 6d. a pound and 1d. per pound in convenient though rough reckoning equals £9 per ton. A ton of meat is worth, therefore, over £50. A ton of butter is worth at least £100. Now 50s. is a very unusually high rate for meat, and still more unusually high for butter. The half of these rates is probably quite as much as the average-distance consignment pays. In other words, a ton of meat pays for railroad carriage from 2½ to 5 per cent. on its value, a ton of butter certainly not more than 1¼ to 2½ per cent. Take even the instance where the railroad rate presses the hardest. The consumer pays for milk 1s. or 1s. 4d. per gallon; the railroad company gets out of this somewhere about, on the average, ¾d., say 7 per cent. . . . When we know that the gross retailer's profit ranges anywhere from 20 to 100 per cent. on the price as received for the article by the producer, it is absurd to say that 1¼ to 7 per cent. on the retail price, or if you will 2½ to 14 per cent. on the producer's price, is a charge that strangles trade. Indeed, considering the value and the indispensability of the service rendered by the railroad company, and the enormous cost at which that service is furnished, it may fairly be claimed that the railroads only charge a very low percentage. . . .

Let me give an instance of the strangling trade theory when brought to the test of actual facts. Members of the Institution will, I daresay, remember the action brought two or three years back before the Railway Commission by the Mansion House Association on Railway Traffic against the South Western Railway in reference to the Southampton import rates. In that action, the cost of which, oddly enough, was defrayed by a London dock company, much was said to the grievance of the Surrey makers of cheese and the Hampshire producers of bacon. The rates, it was said, strangled trade, and the figures certainly showed that Fareham, for instance, only sent to London a few hundred weight of bacon in the twelvemonth. But unfortunately for the trade-strangling theory the figures also showed that the same rates which were supposed to prevent the transmission of bacon from Fareham to London did not prevent the Fareham consumer from bringing down from London some hundreds of tons of bacon during the same period. Here is another instance to the same effect. A general manager told me the other day that his railroad brought into England and up to London last autumn some five or six hundred tons of blackberries through a single port. The rate he got for their carriage was, as he expressed it, "a good fat one." He only wished, he went on to say, that he could have got English blackberries to carry at the same rate; unfortunately they were not forthcoming. It was not these extortionate railroad rates which enabled the foreigner to do a presumably profitable business, or which left tons upon tons of blackberries unpicked on our Devonshire hedges.

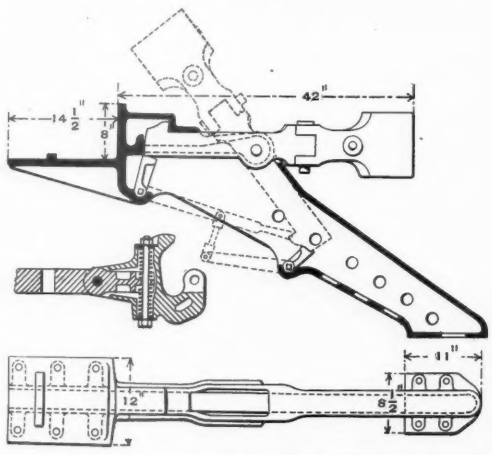
We all want lower railroad rates, English farmers included. And English farmers at least can have them if they choose, to their own great advantage and also to the profit of the railroad companies; but to get them the farmer must abandon his old fashioned retail methods in favor of modern economical wholesale methods of business. Let me give you one instance to show the enormous economy of the wholesale business. In the Southampton Docks case, to which I have already alluded, it was shown that American bacon, which was consigned in truck loads and often in train loads, was charged 6s. per ton between Southampton and London. English bacon, consigned not in train loads but in parcels of a few hundredweight, was charged for an equivalent distance 15s. per ton. "Favoring the foreigners surely," said the plaintiffs. But the defendants produced carefully detailed evidence, which was not cross-examined and hardly challenged, showing that at the 6s. rate the American produce gave them a gross earning of 12s. 6d. per train mile, while the train which had to potter about at roadside stations picking up the English farmer's odds and ends of traffic only managed to earn some 5s. per mile, and the cost of working the local train was, if anything, greater than that of working the train fully loaded with import traffic. Just see what this means. Cost of working averaged about 2s. 6d. per train mile. Therefore with American produce the net earnings per train mile was 10s., with English produce 2s. 6d. In other words, by adopting wholesale methods the railroad company earned a four times greater profit, while charging a rate only two-fifths as high.

Now of course I am not suggesting that under any conceivable circumstances a roadside station in Hants or Wilts could furnish traffic to match in volume that which is poured in through great ports like Southampton, or Hull, or Liverpool. . . . But what I do say is that English farmers can, if they choose, command rates much nearer the wholesale scale than they are paying at present.

A Reversible Pilot Coupler.

A number of roads are now replacing the fixed locomotive pilot couplers with those of the reversible type, so that when not in use the couplers can be turned back out of the way. In several cases where animals have been struck the fixed couplers have been held responsible for derailments; instead of being thrown clear of the track, animals have caught under the couplers, slid down and finally got under the locomotive. With couplers mounted so as to be reversible the pilot is clear. This is shown by the accompanying engravings of the latest form of the Leeds reversible coupler made by the Shickle, Harrison & Howard Iron Company, of St. Louis, Mo. The frame and coupler are both of open hearth cast steel and the whole rigging weighs 425 lbs. and is designed to greatly strengthen the pilot. By raising the hand lever, the locks are released, so that the coupler can be swung up or down and the same operation of the lever locks the coupler in either position. As shown, the draw head is pivoted and is centered by a pair of springs, making it easy to pass sharp curves.

Leeds Reversible Pilot Coupler.



Leeds Reversible Pilot Coupler.

Accidents to Passengers in England and America.

The Board of Trade accident record for the railroads of Great Britain and Ireland, which was summarized in the Railroad Gazette of June 2 last, page 387, has lately been again referred to in the daily newspapers, and a correspondent asks us to state how the number of fatal injuries to passengers compares with the number shown in the accident records of this country. The only answer to be made is that no fair and accurate comparison can be made, because the English records do not give the total number of passengers carried, all riding on season tickets being omitted; and they do not give the passenger mileage, so that even if the total number of passengers were known it would still be impossible to get a true measure of the volume of business.

In the absence of data for an accurate comparison we have, however, made a comparison based on the number of passenger train miles. If we may assume that the average seating capacity of trains is approximately equal in the two countries, this comparison is not without some significance.

The number of passengers killed from all causes has, of course, less connection with the train mile than the number killed in train accidents, but the train mile is nevertheless of considerable value as an index of the total number of passengers carried. The number of passengers killed in train accidents is, of course, a definite small number in both countries, and the term "train accident" is applied, no doubt, to practically the same kind of occurrences in both. The number killed on the railroads of Great Britain will be seen, however, to have varied greatly during the three years reported, a fact which reminds us to be cautious about drawing conclusions from any one year.

The figures here given for Great Britain and Ireland are taken from the Board of Trade reports, and those for this country are from the annual reports of the Interstate Commerce Commission.

As a matter of interest we have added the averages of personal casualties from train accidents to employees and other persons, based on the mileage of all trains, passenger and freight.

Fatal and Non-Fatal Accidents to Passengers and Employees in England and the United States.

	United States. Year ending June 30.			United Kingdom. Year ending Dec 31.		
	1898.	1897.	1896.	1898	1897.	1896
Miles of railroad	186,396	184,428	182,777	21,659	21,433	21,277
Passengers carried, thousands	501,067	489,445	511,773	1,062,911	1,030,420	980,339
Passenger miles, millions	13,380	12,257	13,049			
Passenger-train miles, thousands	341,527	335 018	332,854	209,008	202,200	193,661
Passengers killed (all causes)	221	222	181	153	133	93
Same per million passenger-train miles	0.648	0 663	0 544	0.731	0.658	0 480
Passengers injured (all causes)	2,945	2.795	2,873	1,870	1,639	1,586
Same per million passenger-train miles	8.625	8 372	8.631	8.517	8 105	8 200
Passengers killed in train accidents	74	96	51	25	18	5
Same per million passenger-train miles	0 217	0 281	0.153	0.124	0 089	0.026
Passengers injured in train accidents	1,284	1,135	1,266	632	324	388
Same per million passenger train miles	3.467	3.388	3.803	3 024	1.609	2 003
Total train miles (passenger and freight) thousands	845,293	799,981	812,354	380,255	367,876	353,406
Employees killed in train accidents	366	349	348	16	9	3
Same per million train miles	0.433	0.436	0 430	0.042	0 024	0.008
Employees injured in train accidents	2,293	2,114	2,154	110	140	151
Same per million train miles	2 713	2 643	2 651	0 289	0 380	0.427
Other persons killed in train accidents	94	164	109	2	7	0
Same per million train miles	0 110	0 205	0.134	0.0 5	0 019	0
Other persons injured in train accidents	225	414	224	3	12	8
Same per million train miles	0 266	0 517	0.276	0.008	0.032	0..23

Delaware & Hudson Pushing Engines.

The Schenectady Locomotive Works have recently built for the Delaware & Hudson Company six pushing engines with 22 x 28 in. cylinders and wide fireboxes. These are almost identical in external appearance with the 15 consolidation road engines which we illustrated and described July 28, page 539. In the descriptive specifications which follow we omit nearly all of the facts which are identical for the two engines. If the reader cares for further particulars of the pushers he can get them by referring back to the earlier description of the road engines.

These latest engines were limited in weight and special effort was made to get as much heating and grate surface as possible within the limits allowed. It will be observed that the grate surface is 90.19 sq. ft., and the total heating surface 3,348 sq. ft. This is believed to be the largest heating and grate surface ever secured in a locomotive of this total weight.

The driving wheels have cast steel centers, the centers for the main wheels being heavier than those for the other drivers. The rods are of channel section and the driving axles have enlarged wheel fits. The frames are of cast steel.

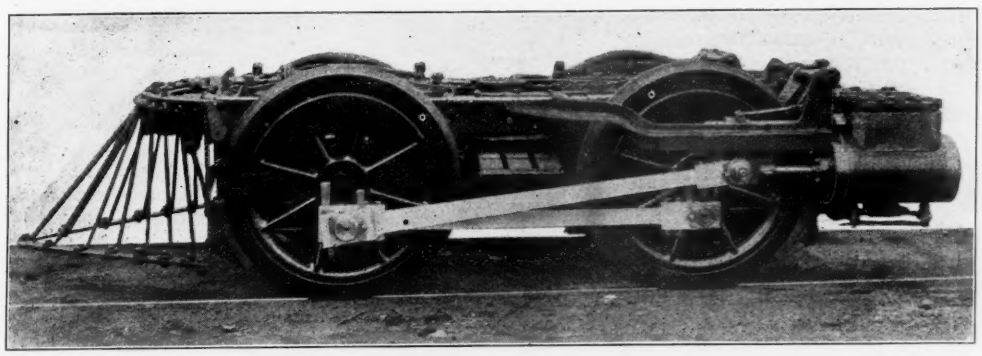
Schenectady Pushers for the D. & H. Co.

Weight in working order	176,000 lbs.
" on drivers	157,500 lbs.
Diameter of cylinders	22 in.
Stroke of piston	28 in.
Horizontal thickness of piston	5½ in.
Diameter of piston rod	3¾ in.
Diameter of driving wheels outside of tire	50 in.
Material " " " centers	Cast steel
Tire held by	Shrinkage
Driving box material	Cast steel
Diam. and length of driving journals	9 in. dia. x 10 in.
" " " main crank pin journals (main side 7 in. x 5¼ in.)	6½ in. dia. x 6 in.
" " " " side rod crank pin journals (Inter. 5½ in. x 4¾ in.) F. and B. 5 in. dia. x 3⅝ in.	
Boiler, outside diameter of first ring	74 in.
Working pressure	180 lbs.
Thickness of plates in barrel and outside of firebox	⅜ in. and 9/16 in.
Horizontal seams	Butt joint sextuple riveted, with welt strips inside and outside
Circumferential seams	Double riveted
Firebox, length	120 in.
" width	108 in.
" depth	Front at center 71 in., back 61½ in.
" crown staying	Radial 1 in. diam.
" stay bolts	⅞ in. and 1 in. diam.
Tubes, number of	417
Heating surface, tubes	3,036.26 sq. ft.
" " water tubes	86.75 sq. ft.
" " firebox	225.53 sq. ft.
" " total	3,348.54 sq. ft.
Grate surface	90.19 sq. ft.
Exhaust pipes	Double, high
" nozzles	3⅜ in., 3½ in. and 3⅝ in. diam.

A Fast French Express Train.

Mr. Charles Rous-Marten, in a recent article in the "Engineer," London, gives the schedule of the

Sud Express, which has been run four times a week since last June by the Orleans and Midi lines. The portion of the run considered is between Paris and Bayonne. This distance is 486¼ miles and the running time is 9 hrs. 12 min., including stops, so that the average speed without deductions is 52.8 miles per hour. Between Paris and Bordeaux, 363¼ miles, the average rate is 54.2 miles an hour, including stops, which Mr. Rous-Marten says is the fastest regular long distance run in the world. The weight of the train without the engine and tender is 131 English tons (293,440 lbs.). The following table gives



Truck of the Latest Kinetic Motor Car.

the schedule and also the observed times taken by Mr. Rous-Marten during a recent trip.

Condensed Log of Sud Express—Paris to Bayonne.

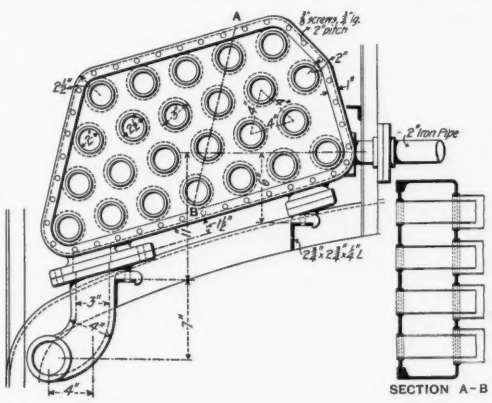
Distance, Miles.	Stations.		Schedule Times.	Actual Times.	Remarks.
	Orleans Line:				
.....	Paris	Dep.	8:23	8:28	Engine No. 74.
73¾	Orleans	Ar.	9:43	9:57:37	Delayed 14 min. by train in front broken down.
		Dep.	9:47	10:03:43	Engine No. 77.
143½	Tours.	Ar.	10:59	11:10:28	
		Dep	11:04	11:16:00	Engine No 78
206	Poitiers.....	Ar.	12:12	12:23:30	Delayed 2 min. by signals.
		Dep.	12:16	12:28:50	Engine No. 85.
276¼	Angoulême.	Ar.	1:30	1:42:22	Delayed 2 min. by signals.
		Dep	1;34	1:47:32	Engine No. 86
	Midi Line:				
363¼	Bordeaux...	Ar.	3:05	3:12:42	
		Dep.	3:15	3:20:02	Engine No. 1752.
431	Morcenx ...	Ar.	4:27	4:30:40	
		Dep	4:33	4:36:10	
455¼	Dax	Ar	5:00	5:03:00	
		Dep.	5:02	5:06:00	
486¼	Bayonne	Ar.	5:35	5:40:06	Watch 5 min. fast by railroad time.

Schedule and Actual Times of Sud Express between Stations.

Stations.	Distance, Miles.	Times, Minutes & Sec'nds		Speeds, miles per hour.	
		Schedule.	Actual.	Schedule.	Actual.
Paris to Orleans.... ...	73¾	80	75:37*	55.3	58.5
Orleans to Tours.....	69¾	72	67:25	58.1	62.1
Tours to Poitiers.....	62½	68	67:30†	55.1	55 5
Poitiers to Angoulême ..	70¼	74	73:32†	57.0	57.3
Angoulême to Bordeaux.	87	91	85:10	57.3	61.4
Bordeaux to Morcenx ..	67¾	72	69:58	56 2	58 1
Morcenx to Dax.....	24¼	27	26:50	54.9	55.1
Dax to Bayonne.....	31	33	34:00‡	56.3	54.7

* et time; delayed 14 min. by broken-down train in front.
† Delayed 2 min. by signals.
‡ Delayed 1 min. through priming of engine.

A comparison with the Empire State Express of the New York Central shows that there is little difference in the matter of schedules. As is well known, the schedule speed westbound between New York and Buffalo, 440.2 miles, including stops, is 53.35 miles an hour and the four cars of this train weigh ap-



Air Condenser on Top of a Kinetic Motor Car.

proximately 330,000 lbs. As shown by the reports published in our issue of May 13, 1898, p. 335, this westbound train during 1897 arrived at the end of its trip within 5 minutes of schedule time on 268 days out of 313, or 86 per cent. For the number of "record runs" made when late it undoubtedly surpasses any other regular train.

The Kinetic Motor.

References have already been made* to the stored-steam motor car that is being exploited by the Kinetic Manufacturing Co. of New York. Recently a trial exhibition run was made over the tracks of the Long Island Railroad between Babylon and Farmingdale, and since then the road between these places has been reopened for regular passenger service with this motor. The motor consists essentially of an engine which uses steam at a pressure very much below that of the boiler. In the motor car under consideration this engine is put on one of the bogie trucks, while the other truck is of the ordinary construction. The boiler consists of a pair of double shells, or four in all, that are designed to sustain a pressure of 180 lbs. per square inch of surface, one small firebox serving for the whole battery. As it is not the intention of the owners that a special fireman be required for the work, the firebox door is accessible only from the ground, and the firing is done with hard coal at terminals only. Since the small quantity of coal that can be stoked at once would be quite insufficient to maintain the requisite steam pressure for the trip, the boilers are used as storage reservoirs of water that has been heated in a stationary plant. The boilers of this plant are fired until their pressure rises to between 180 and 200 lbs. per square inch, and then a connection is made below the water line with the boilers of the motor. The latter are thus filled with water heated to a temperature corresponding to the above pressures, and this stored heat can be drawn on to supply steam at a reduced pressure for the engines.

Meanwhile the fire under the boilers serves to supply, in part, the heat that is drawn off. In the case of the run referred to, the motor left Babylon with 180 lbs. pressure and ran the distance to Farmingdale, seven and one-half miles, in about 18 minutes, using an initial pressure in the cylinders of 20 lbs., and with a total loss of pressure in the boilers of 40 lbs., so that the boiler pressure was 140 lbs. per square inch at the end of the trip. A stop of ten minutes was made at Farmingdale, during which time the fire under the boilers had raised the pressure to 180 lbs. again, and the motor started on the return trip under similar conditions as at first. The return trip was made under practically the same conditions as the outward, and with the same loss of pressure.

It was not determined just what the steam consumption was, so that the relative amounts of heat supplied by the fire and the boilers considered as storage reservoirs is not known.

The advantage possessed by this form of motor over the ordinary steam engine is that the engineer can devote his whote attention during the run to the working of the engine, with no care as to the fire or boiler. This is, of course, an important matter where the motor is to be run as an ordinary street car, liable to be stopped on signal at frequent intervals. Two men only are required to operate the car.

There is one feature which we have not formerly described that is somewhat novel. We refer to the use of an air condenser for condensing the exhaust steam. This condenser, which is put on the roof of the car, consists of two headers into the two faces of which pipes are expanded and beaded. The pipe extending between the outside faces of the headers is open to the atmosphere at each end and serves for the passage of a current of air. These pipes are enclosed in others that are larger and are expanded into the inner faces of the headers. These latter are exposed to the atmosphere over the whole extent of their outer surface. Exhaust steam is admitted to one of the headers, and in passing to the other it is divided up and made to flow through the confined space between the inner and the outer pipes. As these pipes are cooled by the air currents passing over and through them, the steam is condensed and escapes into the other header in the form of vapor which is precipitated to the bottom and flows down to a tank placed beneath the car. The result is that the car runs without making any noise with its exhaust and with no visible escape of steam. As the exhaust flows into a tank which is open to the atmosphere, there is, of course, no vacuum produced and the best that could be expected from an indicator card would be that it would show the back pressure line dropping down to atmospheric pressure. The claims that are made for the air condenser are that it prevents the escape of steam and stops the noise of the exhaust in passing through streets where such an escape and noise would be objectionable.

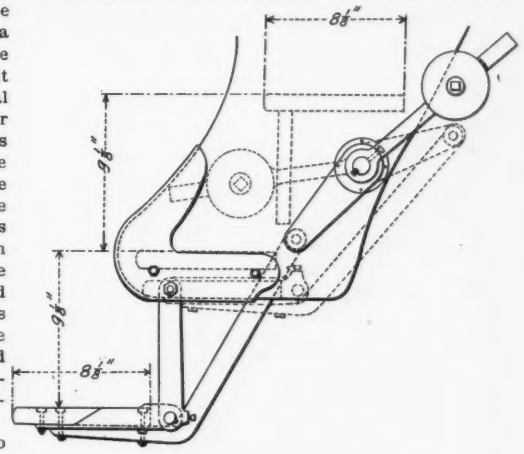
* Railroad Gazette, May 13, Sept. 30 and Oct. 7, 1898.

In running the car the actual controlling is done in very much the same way as that of the electric car. There is a controller at the forward end of the car which combines a reducing and throttle valve and the reversing gear. By means of the reducing valve the motorman can set the initial pressure for the cylinders at any point he desires, depending on the work to be done. On the run from Bablyon to Farmingdale it was 20 lbs. per square inch. There is also before him a gage showing the boiler pressure. The point of cut-off is regulated as in a locomotive, by the adjustment of the links. This adjustment also serves for reversal.

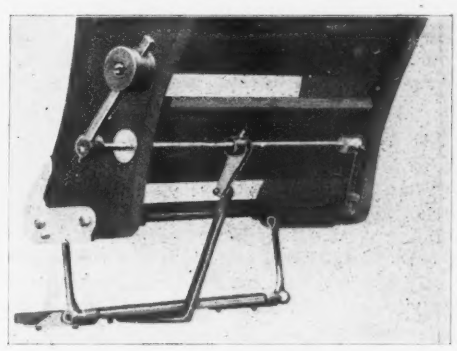
One of the trucks, showing the general arrangement of the cylinder and the driving machinery, is shown in the accompanying engraving.

An Extension Car Step.

The accompanying engravings show a simple extension car step which is being put on the market by Mr. S. H. Wheelhouse, Lincoln Trust Building, St. Louis, Mo., to be known as the "Saunders" step. It has been designed so that it can be attached without altering the present construction. In the drawing, the full lines show the position of the levers when the bottom step is lowered and the dotted lines show the raised position; moving the weighted lever at the side operates the extension. In the lower position, a weight on the extension step is taken by the vertical side hangers and a rod beneath the lower fixed step, which the central lever engages, forms a stop and resists the tendency for the extension step to tilt. The counterweight on the operating lever holds the extension in place when folded up so that no locking devices are used.



Saunders Extension Car Step.



The Saunders Extension Car Step.

Foreign Railroad Notes.

A German newspaper reports that the Spanish Northern Railroad has recently ordered 10 locomotives of the works in Hanover, Germany, to be delivered in the last half of 1900, for which it is said $17,280 each will be paid, and that without tenders.

It may be remembered that in the long Giovi tunnel, not far from Genoa, the ventilation was so bad that there were many cases of asphyxiation, one of which resulted in a very serious accident. In this tunnel the Saccardo system of ventilation has been introduced, and now, even when traffic is heaviest, there is no more trouble. A similar apparatus is in use in the Gotthard tunnel, and it is to be applied in several tunnels on the line between Turin and Savona.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.

PUBLISHED EVERY FRIDAY,

At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to improvements. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

During the month of November we noted in our news columns orders for 11,281 cars of all kinds and for 396 locomotives. Of the cars, 4,507 were box, stock and furniture cars; 3,845 were gondola, coal and ore cars; 1,863 were steel cars; 580 were flat cars, and 486 were for passenger and street railroad service. About 1,300 of the cars noted are to be built by the railroads at their own shops. Of the 396 locomotives noted, 22 were for export, and the division of types was approximately 73 passenger, 268 freight and 55 switching locomotives. The orders for locomotives were about 20 per cent. more than in October, while that month showed a number of orders far in excess of any previous month of this year. The car orders in November were only about one-third those placed in October, and less than those placed in August, but were greater than those placed in the other summer months or in September. It is understood that both locomotive and car builders are well filled with orders far into the New Year, and while no exceptionally large car orders for the immediate future are now in sight, the aggregate of orders actually under consideration is more than equal to those placed during November.

In the admirable round-up of the work of President Clark, which appeared in the Railroad Gazette last week, Mr. Deming says "stockholders complain of sinecures, of improvements too æsthetic, of two men who do one man's work, in a corporation whose growing revenues have never yet felt the pressure of close economy." We have no sermon to preach from the several texts contained in this sentence, but would say one word about the matter of two men to do one man's work. We are not closely acquainted with the administration of the New York, New Haven & Hartford Railroad. There are, however, several railroads whose administration we do know about in a more or less superficial way, and we have yet to find a railroad in the United States that is not undermanned. So far as we can see, the one railroad system that comes nearest to being sufficiently manned is the Pennsylvania, and we venture to say that the somewhat ample force provided on that railroad is one of the most important elements of its economical and successful administration. So far as we can observe, every railroad runs too shorthanded for economy. The working staff is so absorbed in the routine of daily duty that it does not have time to study and think. Work is carried on in the old costly way because there is nobody who can sit down quietly and spend a few weeks or months carefully studying the elements of any given situation and devising a better way of handling the work. This is not a mere theoretical statement; it is the statement of a fact which often comes before us, and it is probable that nine out of ten general managers and general superintendents in the United States will confirm what we have said. It is often remarked that only the rich can be really economical, and it is a fact that only the adequately officered railroad can be worked with efficiency and economy. We should not wonder if it would be a good plan for the officers of the railroads to develop this theme a little in their reports, for the education of directors and stockholders.

In view of the troubles from broken stay bolts in locomotive boilers the stay bolt designed by Mr. F. W. Johnstone, and shown in this issue, having a ball and socket joint at the outer sheet, will be of interest; for this reason we have described in considerable detail how these stay bolts are made and applied on the Mexican Central. Recent discussion of this topic has left the question of stay bolts and their breakage so fresh in the minds of our readers that a long review of the situation would be mainly a repetition of what has already been published several times within the last two years. But any one who cares for a review of the stay bolt situation is referred to our issues of March 18 and September 16 of last year. However, it may not be out of place to say that the principal facts so far brought out are that the majority of breakages occur in the upper rows of stay bolts, the bolts break near where they enter the outer sheet, and the principal cause of this breakage is alternating stresses set up in the bolt by the expansion and contraction of the firebox; these stresses being a maximum at the point where the bolt enters the side sheet. Attempts have been made to add to the life of stay bolts by increasing their length and by reducing the diameter of the bolts between the sheets, and laboratory tests as well as results from actual service, indicate that both expedients are useful. The results of laboratory tests also show that nickel steel is better able to withstand alternating stresses than the materials commonly used, and this fact has prompted a few roads to make service tests of nickel steel stay bolts * The results of some of these experiments should be available before long, but none of these remedies are calculated to effect anything like a permanent cure for stay bolt troubles. In this, the stay bolt having a flexible joint next to the outer sheet differs from the usual practice; the theory of the flexible bolt seems to be correct, and one prominent road has used something of this kind for several years with good results, but just now we do not know in what favor the flexible bolt is held. The idea of a flexible stay bolt is by no means new, and probably the most important feature of Mr. Johnstone's design is its simplicity and cheapness. In these respects it differs from other designs which we have seen, and probably the first cost of flexible stay bolts has deterred many roads from using them. From the description of these bolts almost any foreman can estimate quite closely for how much they can be made and applied in his shop.

* See Railroad Gazette, March 18, 1898.

Freight Car Repairs.

It was shown in our issue of November 17 that there is a wide difference in the available figures of freight car repairs, one road stating that the repairs to draft rigging are 12 per cent. of the total, others 33 to 40, 37.5, 45 and 70 per cent., respectively. This is not based on the cost of repairs, but on the number of cars repaired. Mr. West's estimate of 33 to 40 per cent. was based on reports from a number of repair yards on the New York, Ontario & Western, and Mr. Bronner's 37.5 per cent. was obtained from Michigan Central reports for the entire road. Since these figures were published Mr. A. E. Manchester, Assistant Superintendent of Motive Power, of the Chicago, Milwaukee & St. Paul, has furnished data from an important repair yard of that road. As no regular records are kept of such work the count covers but a short period. It was found that 43 per cent. of the damaged cars had defective draft rigging only, and 24 per cent. of the total had defective draft rigging as well as other broken parts; making in all 67 per cent.

For seven or eight years past Mr. Bronner has received daily reports from each repair yard on the Michigan Central showing the nature of the repairs to each car, and at the end of the month these reports are filed. The number of cars reported in this way during a month is about thirteen thousand and while these form a valuable record, obviously, to make a summary of the repairs for even one month is a tedious job. The accompanying tables contain data which we have compiled from these reports, and it is believed that they show approximately the correct ratios and answer present purposes fairly well.

It was desired first to know the ratio between the total number of cars set out and those requiring repairs to draft rigging, and second to know how the draft rigging repairs were distributed among the different parts. It may first be well to say, that in the compilation if a car had some defect in the body* or truck in addition to defective draft gear, it was included with those cars having draft rigging defects only, and cars having more than one part of the draft rigging defective were listed under the more important defect. As an example, in many cases of defective draft timbers the bolts also had to be renewed and sometimes other pieces.

Table I shows the cars repaired at the Detroit yard during the month of October for five consecutive years; also, the cars repaired during one month of 1893 at all the repair points on the main line and branches, Michigan Central and foreign cars being included in all cases. There seems to be but one special reason why the ratios shown by the repairs at Detroit should differ from those at other places on that road, and possibly other roads working under similar conditions. That is, the facilities at Detroit for changing wheels result in an unusual

TABLE I.—FREIGHT CAR REPAIRS ON THE MICHIGAN CENTRAL RAILROAD.

Defects.	Repair tracks at Detroit for month of October.					Whole system for one month.
	1899. No. cars.	1898. No. cars.	1897. No. cars.	1896. No. cars.	1895. No. cars.	1893. No. cars.
Car body:						
Sides, roof, transoms, floors and underframe, except deadwoods and draft gear	239	.....	324	.....	444	.....
Air-brake hose	145	.....	92	.....	140	.....
Attachments and miscellaneous parts, including air brakes, brake rigging (except hose), doors, center plates and pins, grab irons, ladders, etc.	579	.....	625	.....	710	.....
Total	963	954	1,041	975	1,294	.....
Trucks:						
Wheels and axles	287	.....	264	.....	225	.....
Journal bearings and wedges	173	.....	215	.....	236	.....
Brake shoes	481	.....	313	.....	365	.....
Brake beams and hangers	175	.....	125	.....	164	.....
Other parts	287	.....	283	.....	316	.....
Total	1,403	1,486	1,200	1,156	1,306	.....
Draft Gear:						
Buffer blocks, cast iron	.....	.....	.....	.....	.....	11
Carry irons	8	.....	3	.....	.....	51
Carry iron bolts	26	.....	35	.....	13	.....
Couplers, including knuckles, pins, locks and rods	184	.....	266	.....	365	1,358
Deadwoods	34	.....	64	.....	33	95
Deadwood bolts	25	.....	41	.....	22	75
Draft springs	131	.....	80	.....	96	474
Draft timbers	31	.....	21	.....	34	249
Draft timber bolts	136	.....	147	.....	176	1 008
Drawbar stop castings	18	.....	18	.....	22	205
Drawbar stop casting straps	7	.....	6	.....	11	129
Drawbar stop and strap bolts	68	.....	107	.....	215	657
Drawbar tail bolts, keys and continuous rods	18	.....	9	.....	.....	267
Drawbar yokes and bolts (or rivets)	2	.....	8	.....	14	158
Entire new rigging—Draft timbers, couplers, stops, followers and springs	7	.....	5	.....	1	.....
New rigging—couplers, followers and springs	10	.....	4	.....	12	.....
Follower plates	29	.....	39	.....	55	476
Total	734	578	853	789	1,069	5,211
Grand total	3,106	2,018	3,094	2,920	3,669	13,865

Fig. 5.—Train Platforms for Loop Tracks, Beneath Main Floor.

Fig. 6.—Interior of Trai
Showing Wide Platforn
Long Inward Trains

Fig. 8.

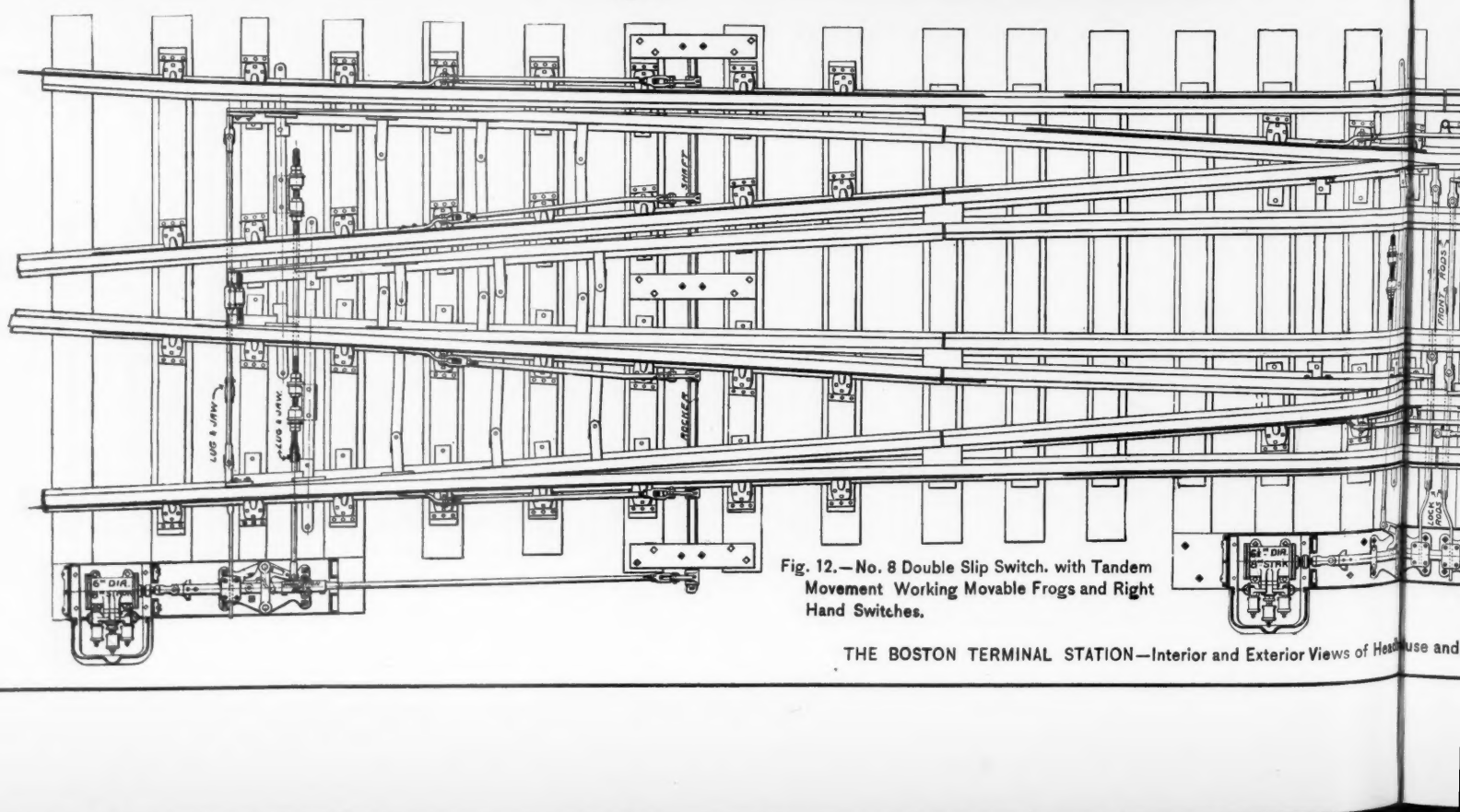


Fig. 12.—No. 8 Double Slip Switch. with Tandem Movement Working Movable Frogs and Right Hand Switches.

THE BOSTON TERMINAL STATION—Interior and Exterior Views of Hea use and

nterior of Train Shed,
g Wide Platform for
g Inward Trains.

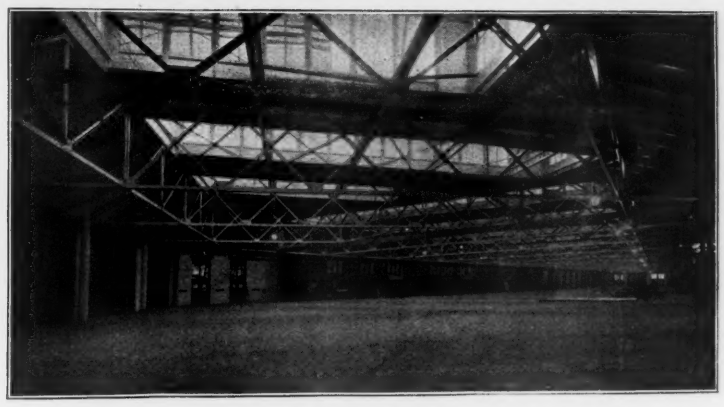


Fig. 7.. -Interior of " Midway," from a Point Near the Parcel Room.

Fig. 9.

Fig. 10.—Cross Section of the Switch Shown at the Left in Fig. 12 Showing the Lock Bar and the Point Separators

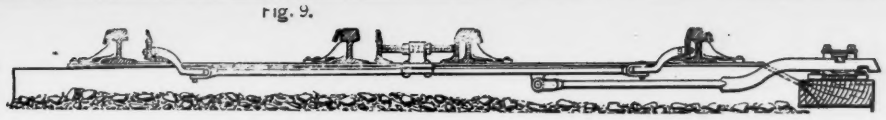
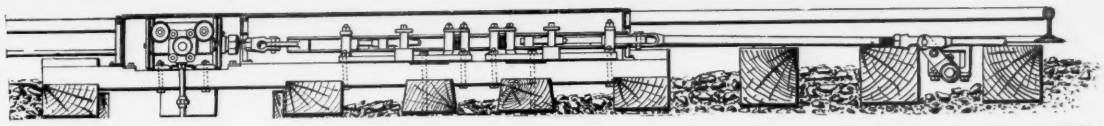
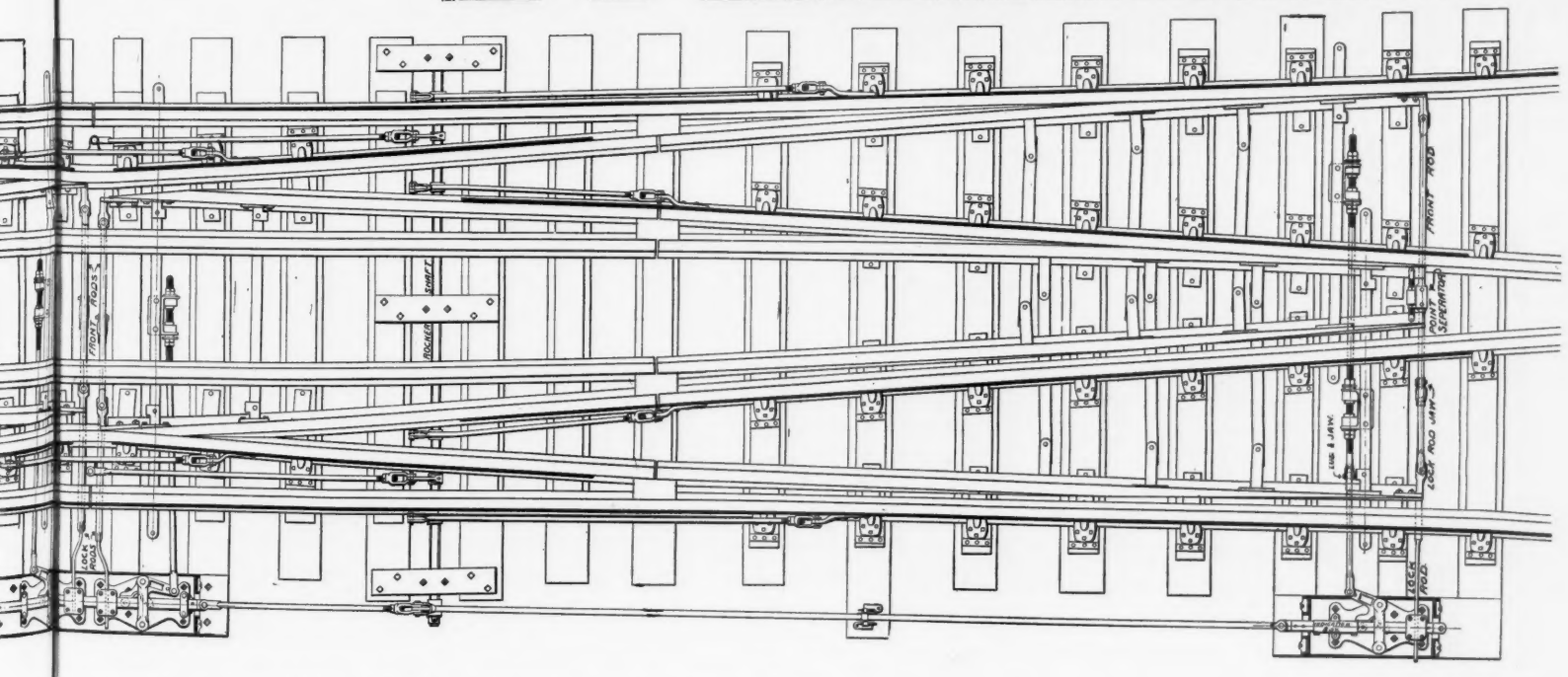


Fig. 11.—Elevation of the Movement Shown at the Middle of Fig. 12.





of Hea use and Train Shed, and Illustrations of Switch Apparatus to Accompany Mr. Coleman's Article.

amount of such work being done at that point; this would tend to reduce slightly the ratio of draft rigging repairs, but on the other hand this may be offset by the harder use cars may get in the Detroit poling yard.

The Detroit figures, in Table I, include renewals of air brake hose, brake shoes and journal bearings, and as this work is ordinarily done in the yards without causing delays to cars, the three items named are not included in Table II., which shows comparative figures. It will be seen that the ratios are remarkably uniform, and that the number of cars having defective draft rigging is from 25 to 37 per cent. of the total; probably one-third may be taken as an average round number while the maximum may be 40 or 45 per cent., but certainly not 70 per cent. in this instance. The other repairs seem to be about equally divided between the car body and the trucks.

Table I shows clearly that most of the running repairs to cars are on account of the attachments and miscellaneous parts. In the case of the car body, twice as many cars were held for repairs to such parts as brakes, brake rigging, doors, ladders, center plates, etc., as for repairs to the framing and body proper. Also, the defects in brake beams and hangers were about half those of all other parts of the truck if wheel renewals be excluded. The largest item under draft rigging is couplers, and then comes draft timber bolts, draw bar stop and strap bolts, and draft springs; about in the order named. These figures also show that just one-half the draft rigging repairs would be affected by the general use of metal draft beams having twice the life of the car. Stronger attachments, greater spring capacity and doing away with the violent recoil of the springs should materially affect the other half of the draft rigging repairs, but obviously the springs and parts subject to wear will in time require renewal; these renewals, however, should be less frequent in the stronger draft rigging.

Table II. Comparison of Freight Car Repairs for One Month.

Defects.		1899*	1898*	1897*	1896*	1895*	1893†
Car body	Number	818	814	949	819	1,154	.....
	Per cent.	36	35	38	37	39	.....
Trucks	Number	749	922	672	630	705	.....
	Per cent.	32	40	27	28	24	.....
Draft gear	Number	734	578	853	789	1,069	5,211
	Per cent.	32	25	35	35	37	37.5
Total number of cars.		2,301	2,314	2,474	2,238	2,928	13,865

* Repair tracks at Detroit only.
† For the entire system.

The six great French companies in 1898 worked 20,703 miles of railroad, with a train service equivalent to very nearly 12 trains each way daily over the entire mileage. The gross earnings were at the rate of $12,120 per mile, almost exactly one-half of which was net (50.02 per cent.). The average cost of these railroads per mile had been $122,485, of which $18,968 was for rolling stock. The average receipt per train mile was $1.39½. The passenger traffic in 1898 was equivalent to the movement of 454 persons each way daily over the whole mileage, and the average receipt per passenger mile was 1.18 cents, not including the government tax. The freight traffic was equivalent to the movement of 649 tons of freight each way daily, and the average receipt per ton per mile was 1.367 cents. The average length of haul was 87 miles. The average rate on coal and coke was 0.878 cent per ton-mile on the Northern Railroad, which is the greatest coal carrier, having carried 14,166,735 tons in 1898, which was 44 per cent. of its total freight. The reform in passenger fares and express goods rates began in 1892. Compared with 1891, the last year of the old rates, the results in 1898 show:

An increase of	9.3	per cent.	in	mileage worked.
" " "	53.6	" "	"	number of passengers.
" " "	43.7	" "	"	passenger mileage.
" " "	22.1	" "	"	" earnings.
" decrease "	33.0	" "	"	" tax.
" " "	22.5	" "	"	earnings per pass. mile.
" " "	6.7	" "	"	average journey.

The significant fact is that in the seven years the passenger traffic has increased 43.7 per cent. and the passenger earnings 22½ per cent. Traffic and earnings were increasing steadily before the reduction, and while doubtless the travel has been increased by that change, it is doubtful if passenger earnings have been. From 1897 to 1898 the increase in passenger traffic (mileage) was 3¼ per cent.; in passenger earnings, 2 per cent.

While great stress is laid on the Siberian Railroad as a route to the Orient which avoids water transportation in the East, special pains have been taken by its managers to give it a water outlet to the West, although the railroad communication that way is complete and quite direct. We have heretofore mentioned the commercial agency established by the government in Archangel, which will act as forwarding and commission agent for shippers over the railroad. Archangel is reached from Cheljabinsk, the western terminus of the Siberian Railroad proper, by an old railroad extending northwest along and across the Ural Mountains, a distance of 465 miles to Perm, on navigable waters of a branch of the Volga; thence over a new railroad west and northwest some 600 miles to Kotlas, on the river Dwina, some 500 miles northeast of Moscow; there the freight is to be transferred to river barges and towed down the river some 400 or 500 miles to Archangel; there transferred to ocean steamers which will sail through the White Sea, the Arctic and the North Sea to Western European ports. A contract has been made with the steamship company "William Miller & Co., of Rotterdam," for the steamer service. The traffic for which immediate provision is made is chiefly export grain, and there seems to be a feeling that if shipped in this way, not passing through the populous part of Russia, it will compete less with the grain of European Russia, the price of which, however, except in isolated districts, must be governed chiefly by the world's demand, as is the price of wheat in Kansas and Oregon. A disadvantage of this route is that the navigable part is in the extreme north of Russia, and must close early, while the Siberian harvest is late, and probably it would not be possible to market more than a small part of the crop in the year in which it is raised.

The Italian railroads have just adopted a new tariff for parcels of 44 lbs. and less. The old one had four classes, and increased for every increase of 50 kilometres (31 miles) in distance. The new one has but two classes, a general one, and one covering articles of food, intended to facilitate shipments of farm products to the consumer. There is one rate for all distances of 400 kilometres (249 miles) or less, and but one other for all greater distances. Thus the whole tariff is included in the following few lines. The rates are in cents:

	11 lbs.	22 lbs.	33 lbs.	44 lbs.
Provisions:				
Up to 249 miles	9.7	11.6	15.5	19.4
Greater distances	15.5	23.3	31.0	38.8
Other Goods:				
Up to 249 miles	11.6	17.4	23.3	29.1
Greater distances	23.3	34.8	46.6	58.2

It will be seen that in all cases but one the rate for all distances over 249 miles is just twice as great as the rate for that distance; and the excepted case is the provision rate for 11 lbs. or less, which is only 60 per cent. greater. By the tariff, the garden produce of Sicily can be sent for a trifle to the grocer or the consumer in Turin, Milan, etc., and as the last-named cities are almost under the Alps, and Sicily is warmer than Florida in winter, a considerable trade may be expected; though where trade is highly developed, the intervention of the wholesaler, who needs no "parcel" rates, is generally more economical. The sudden doubling of rates on passing 400 kilometres is likely to be felt chiefly at stations just beyond that limit. By this tariff, packages from New York to Utica would pay only half as much as to Rome, which is only 14 miles further.

The Russian Ministry of Transportation reports that in 1898 the number of passengers carried was 14 per cent. and the number of tons of freight 16 per cent. greater than in 1897. The quantity of grain moved increased 15½ per cent., to 414,000,000 bushels of 60 lbs., and of this 251,000,000 were consigned to seaports and 53,000,000 to stations on the German or Austrian frontier, and was presumably nearly all exported; but this quantity was only 6½ per cent. more than in 1897. The Ministry dwells on the inability of the railroads promptly to handle the freight offered. At the opening of the year 1898, 10,800 car loads had accumulated on the West Siberian Railroad and its connecting line; and by March the number waiting to be forwarded had increased to 13,000, and it was not till the end of August that these accumulations were cleared off, after an average delay of 2½ months. On the lines in the east and southeast districts of European Russia, 24,910 car loads were waiting to be forwarded March 13, chiefly grain consigned to Baltic ports, and on the 13th of May the quantity had increased to 29,203 car loads. This freight was scarcely disposed of when, in the first half of August, the accumulations began again, and by October 21 they reached 26,897 car loads, chiefly in Southern Russia, and these were not all forwarded till the close of the year. And this although the harvest of 1898 was below the average.

The report of the Special State Commission to inspect the Chicago Drainage Channel is published this week, and we make a few notes from it elsewhere. It shows that much work remains to be done before the Canal can be called finished. The report is particularly interesting as clearly defining the status of that undertaking. The impression has spread that the water would be turned in soon; but it is evident from the report of the Special Committee that all work must be completed before final approval is given, and that the date of opening of the Channel is still a good way off. Recent reports are, that the Sanitary District Trustees hope that a conference with the Committee will result in certain modifications of the findings, which will enable them to complete part of the work after the water is turned in the Canal. Even if some points are conceded, it is hard to see how the opening can take place for several months.

NEW PUBLICATIONS.

Railway Co-operation: An Investigation of Traffic Associations, etc. By Charles S. Langstroth and Wilson Stilz, with an Introduction by Martin A. Knapp, Chairman of the Interstate Commerce Commission. Publications of the University of Pennsylvania. Ginn & Co., Selling Agents, Tremont Place, Boston, Mass.

This document is made up of two essays which were written in competition for a prize open to a number of students in the senior class of the Wharton School of Finance and Economy of the University of Pennsylvania. The prize was given to Mr. Langstroth and Mr. Stilz's essay received honorable mention. The judges recommended that both papers be published because each possessed much merit and because the two writers had treated the subject differently and in such a way that the essays supplement each other.

Mr. Langstroth divides his essay into four chapters, namely, co-operation of connecting railroads, co-operation of competing railroads, legislation and its results, and the degree and form of co-operation that should be granted to competing railroads. The chief value of the essay is that it is mostly historical, with the minimum of expression of opinion, and that it has numerous references to the published literature of the subject. A short appendix gives the sources of the material and a bibliography. Thus the paper becomes a useful reference manual for those who care to study the subject.

Mr. Stilz divides the subject into two main parts, being the evolution of co-operation and the present needs of co-operation. He takes up the first topic under the headings of co-operation of connecting lines and of competing lines and co-operation to consolidate freight classifications. The second division covers through routing and through rating, freight classifications, co-operation in restraint of competition and a railroad clearing house. His essay is also, and necessarily, a review of the history of the subject, but the personal judgment of the writer appears much more frequently than in Mr. Langstroth's essay and the citations of authorities are extremely few. The whole document has a good alphabetical index.

TRADE CATALOGUES.

Machine Tools.—William Sellers & Co., Inc., Philadelphia, issue a finely illustrated catalogue of 350 pages. Many of the machines which have been added to their list since the last edition was printed are shown, but the progress of machine construction has been so rapid that it is impossible to include all the new machines, some of which are now building. Many of the standard products have been thoroughly revised and such changes have been noted in this catalogue so that the volume as a whole is up to date and will be found valuable to engineers. One of the new machines to which particular attention might be called is a double slotting machine for locomotive frames. This is unusually strong and massive, has a stroke adjustable up to 22 in. and is provided with a Whitworth quick return. This machine is driven by electric motors attached to the traveling heads. This is an entirely new machine, two of which are giving satisfactory results in one of the large locomotive works. The subject of injectors is discussed with illustrations of old and new types. The volume is bound in cloth, printed on excellent paper.

Sewage Disposal.—We noted recently the formation in New York City of the company for the disposal of city wastes. We have now received a pamphlet from Boston announcing the organization of the American Sewage Disposal Company of Boston, with offices at 89 State street, in that city, and 60 Broadway, New York. The President and Manager of the company is Mr. John N. McClintock, C. E. Associated with him in the directory are Mr. John T. McClintock, architect, and Mr. Joseph P. O'Connell, contractor, and certain merchants and bankers. The company offers its services to equip any community with sewers and disposal works. The company seeks not only the business of planning and building sewers and disposal works, but also of continued operation and maintenance of them under contract and bond. It owns valuable patents covering sewage disposal by septic tanks and single and double intermittent filtration.

The Westinghouse Electric & Mfg. Co. recently issued a 34-page illustrated pamphlet descriptive of the Westinghouse railway motors, supplemented by a few illustrations of typical Westinghouse railroad power stations. All the motors illustrated and described in this catalogue have been subjected to severe tests and have been found to meet the trying conditions of modern railroad practice. Among other things of interest, a No. 56 motor, designed for the heaviest city, suburban and interurban work, is described and some efficiency curves of this motor are shown.

The Westinghouse Air Brake Company, in a 37-page illustrated pamphlet, sets forth the claims of

the electro-pneumatic method for controlling railroad and other motors, a description with illustrations of which was given in our issue of Oct. 13 last. This catalogue also contains a description of the new trucks made by the Baldwin Locomotive works to be used in connection with a special design of equipment, of which the electro-pneumatic control is an important part.

Rod Packing.—We are in receipt of a pamphlet from the Reeves Machine Co., of Trenton, N. J., illustrating and describing Harthan's metallic rod packing for use on all types of engines and steam pumps. From the catalogue we learn that the packing is made in the same manner as when first put on the market, it not having been found necessary after years of service to change it in any detail.

TECHNICAL.

Manufacturing and Business.

The International Brake Shoe Company, Chicago, has recently published pamphlets regarding the "Diamond S" brake shoe in several languages for foreign circulation. The Company reports that the prospects are favorable for a large foreign business, many inquiries have been received and several roads are contemplating the adoption of the "Diamond S" brake shoe as a standard.

The W. J. Carlin Company, dealer in steam shovels, second-hand locomotives and cars, contractors' plants and steel works and rolling mill machinery, has located its office in the Lewis Building, Pittsburgh, Pa. Mr. Carlin has formerly associated with the firm of Thomas Carlin's Sons of Allegheny.

Mr. W. B. Bogardus, M. E., formerly Mechanical Engineer and Superintendent of the Sandusky Portland Cement Co., has resigned his position to accept the position of Mechanical Engineer with The Osborn Co., of Cleveland, O., in its cement department.

F. F. Whittekin, of Carfagena, Chief Engineer and General Manager of the Government Railroad of the United States of Colombia, is in Pittsburgh to place orders for material for a narrow-gage railroad to be about 100 miles long. Locomotives, cars and considerable bridge material are wanted.

Edward Robinson, proprietor of the Wells Light Mfg. Co., 46 Washington St., New York City, informs us that the sales of the Wells light for the past three months have been very large, exceeding the sales for the same period for the past four or five years. The prospects are that the output for the next three months will be still larger.

The Fairmount Construction Co. of Philadelphia, electric railroad builders, has increased its capital stock to $200,000. Clarence P. King is President and Josiah B. Seybert Treasurer. The Company has received two more contracts to build electric railroad.

We are informed that the Southern Car & Foundry Co. has received an order from the Pressed Steel Car Co. for forgings to be made at the Anniston plant for 1,000 cars.

At a meeting of the Directors of the Barney & Smith Car Co. held Nov. 14 the resignation of E. J. Barney, as President, was tendered and accepted.

Iron and Steel.

The Duquesne Steel Foundry Co. has been organized and will apply for incorporation in Pennsylvania. Among those reported interested are: A. W. Herron, Thomas Rodd, T. H. Bakewell, E. Kneeland and W. A. Herron. The object of the company is to make steel castings. The proposed capital is $200,000. A plant will be built on the Ohio River near Coraopolis, Pa.

The Ascham Steel Casting Co., Sharon, Pa., will increase its plant to double the present capacity. Work will be begun in the early spring.

The Mann Edge Tool Co., of Lewistown, Pa., has announced an increase of 10 per cent. to all employees, to take effect on Christmas Day.

The plant of the Desert Lixiviation Co. at Barstow, Cal., has been put in operation. It is now reported that a 250-ton smelter will be built near Barstow.

A charter has been granted to T. Rolland's Sons to make iron and steel at Cheltenham, Montgomery County. The capital stock is $150,000. The company has secured control of an old mill in Cheltenham Township.

A report from Tampa, Fla., states that the Southern Iron Works has been organized by D. A. Shey, J. A. M. Grable and Ernest Kreher. A plant owned by the company will be enlarged.

The Columbus Iron & Steel Co. was incorporated in Ohio Nov. 21, by H. A. Marting and others, with a capital stock of $400,000. A blast furnace, with a daily capacity of 300 tons, will be built at Columbus.

The Craig-Ridgway & Sons Co. has been chartered in Pennsylvania to make iron and steel at Coatesville. The capital stock is $100,000.

The Anderson Bolt & Iron Co., now at Anderson, Ind., will remove its plant to Louisville, Ky., and will be known as the Louisville Bolt & Iron Co., with a capital stock of $150,000. The officers are: President, S. S. Bush, Louisville; Vice-President and General Manager, L. S. Raylor, Anderson, Ind.

Reports state that Henry C. Brynside of Greenville has leased iron mines between Peterstown, Va., and Lurich, and that work of developing will shortly be begun.

The Knoxville Iron Co. is having new buildings added to its Harriman, Tenn., plant and will need new machinery.

The Schuylkill Haven Iron & Steel Co. has let the contract for engines and furnaces for a new mill to be built at Schuylkill Haven, Pa.

The Carter Steel & Iron Co. has been organized in Knoxville, Tenn., with a capital of $600,000, which will later be increased to $5,000,000. The new company has absorbed the Blue Springs Mining Co., the Helen Maud Iron Co., the Stony Creek Iron Co., and has control of valuable iron mines in Carter County, Tenn.

The Schiffler Bridge Co. of Pittsburgh has the contract to build the main building for the new plant of the Sharon Steel Co., at Sharon, Pa. The Sharon Steel Co. was incorporated several months ago to make iron and open-hearth steel. The plans for the blast furnace have been completed. It is proposed to have a capacity of 600 tons per day. The contract for the two engines of 1,000 h. p. each has been let to Wm. Tod & Co. of Youngstown, O. Work on the new furnace will probably not be started until spring. It is expected to have the plant in operation six months after work is started.

A bar mill building and boiler house, both of steel frame construction, will be added to the plant of W. D. Wood Co., at McKeesport, Pa.

The Atlantic Tube Co., incorporated in New Jersey last April, proposes to increase the capital from $250,000 to $750,000. The increase will be used for adding buildings and equipment.

Dun's Review says that the iron industry shows no yielding in material, but a little advance in Bessemer pig at Pittsburg, with large inquiries for next year. Prices of rails are maintained, with one contract reported last week of 20,000 tons for Japan, and another pending for South Africa. A single order for car axles covers 33,000, or 8,500 tons. Structural prices do not yield, and angles are quoted higher. But works which have nearly or quite filled their orders are seeking others, with concessions of $2 per ton in eastern plates, $1 in steel hoops and sheets, and in bars at Pittsburgh, while cut nails are quoted $4 lower. The general ratio of prices for all finished products is now 2.34 per cent. lower than Nov. 1, though the average for pig iron is one per cent. higher.

The Manufacturers' Contracting Co. has been incorporated in New Jersey with a capital of $100,000. This company proposes to build factory buildings and public works. The office is at 792 Broad St., Newark, N. J. W. H. Fenn is President.

The Berlin Iron Bridge Co. of East Berlin, Conn., has shipped 27 carloads of structural material to the United States Commission at Paris. It is for the steel framework for an American machine shop in the American exhibit at the Paris Fair of 1900. The building will be 343 x 74 ft.

The Imperial Government Railway of Japan has contracted for 20,000 tons of 60-lb. rails with the Carnegie Steel Company to be delivered before the first of June next.

The Royal Steel & Iron Co. has been incorporated in Maine with a capital stock of $5,000,000. The incorporators are: H. D. Sawyer, C. E. Billings, W. A. Collins, of Boston, Mass., C. G. McIntire and G. M. Smith of Maplewood, Mass. The office will be in Portland.

Fire in the bending shed of the Charlestown (Mass.) Navy Yard Nov. 25 damaged machinery to the estimated amount of $100,000.

The Carbon Steel Co. will spend about $150,000 in improvements to increase the output.

The directors of the Union Switch & Signal Co. have authorized a new plant built at Swissvale, Pa., at a cost of $250,000. Preliminary plans have been made by Thomas Rodd, Chief Engineer of the Pennsylvania Co. (Northwest System). A building 400 ft. long and 300 ft. wide is proposed.

The Pennsylvania and the Cambria steel companies have leased 10,000 acres of ore land in Ashe County, N. C.

The Republic Iron & Steel Co. has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable Jan. 1.

The Pennsylvania Car Wheel Works Sold.

The car wheel works of the Pennsylvania Car Wheel Co., located in lower Allegheny, Pa., have been sold to the Pressed Steel Car Company. The entire output of the plant for the present will be taken by the Pressed Steel Car Co. R. W. Flenniken, Murtle Bldg., Pittsburgh, is Secretary and Treasurer of the Pennsylvania Car Wheel Co.

Harbor Work in Canada.

The Canadian Minister of Public Works is considering plans for the improvement of the harbor of Port Colborne, for which the Canadian Parliament has appropriated $120,000. A breakwater and some wharves are needed and an effort is being made to get the work started at once.

Proposed Rock River Navigation.

At Rockford, Ill., Nov. 23, the Rock River Improvement Association was organized as the first step in an effort to make slack water navigation in the Rock River from Rockford to Sterling, where the feeder to the Hennepin Canal now ends. Over 75 delegates, including manufacturers, business men and mayors and city officials from the interested towns were present. W. L. Eaton of Rockford was made President, Harry Washburn of Sterling Secretary, and J. D. Waterman of Rockford Treasurer. It was decided to ask Congress to authorize an investigation of the feasibility of making Rock River navigable from Rockford to Sterling in connection with the Hennepin Canal. To give the Rock River a seven-foot channel would probably require at least three dams in addition to those now in the river, both the old and the new dams being provided with locks. The present plans of the government raise the river at Sterling nineteen feet above its natural lever at the foot of the water-power dam. This converts the channel into a succession of pools, some of them ten or eleven miles in length. The portions of the river which cannot be readily treated in this way will require a canal. This will, it is supposed, be found necessary to the extent of three miles, and about the same amount of independent canal around and below the dams at Oregon, Grand Detour and Dixon.

A Record of the Performance of a Locomotive.

The Passenger Department of the New York Central Railroad sends out a little folder which is headed: "What the American Mogul Can Do," and which contains a picture entitled "The New York Central's New Passenger Mogul No. 948." At the outset it should be said that the engine in question is not a mogul, but a 10-wheeler, a fact which will be apparent enough to any American railroad man; but the mistake is liable to confuse people on the other side of the Atlantic, into whose hands the folder may fall. The particulars of the performance described were given in full in the Railroad Gazette of Sept. 15, page 635, and we repeat the main facts for the benefit of those readers who may have forgotten this extraordinary feat, although it happened so lately. On Aug. 19 this engine, being a Schenectady 10-wheel passenger engine, took the Southwestern Limited from New York to Albany in three hours and 13 minutes, the distance being 143 miles. The journey speed was nearly 44½ miles an hour, which included two schedule stops. The train was made up of 16 cars and was 1,202 ft. long, and it weighed, with engine and tender, 918 tons. The engine itself carries 128,900 lbs. on the drivers and 40,000 on the truck. The cars were two mail cars, four coaches, one smoking car, one café car, one dining car, four sleeping cars and three parlor cars.

Cement Plants for Pennsylvania.

The General Alsen Cement Co. of Hamburg, Germany, intends to build three cement plants at Nazareth, Pa.

THE SCRAP HEAP

Notes.

Press dispatches report that employees of the Wheeling & Lake Erie who have applied for an increase of wages have been given a favorable answer. Similar reports are published concerning enginemen and trainmen on the Philadelphia & Reading and on the Lake Erie & Western. Employees of the Boston & Maine, on certain divisions in New Hampshire, have had their pay increased.

The order issued by the Interstate Commerce Commission announcing a hearing on the extension of the time limit of the coupler and brake law requires the railroad companies to report the condition of their equipment on Dec. 1; and each company must give notice that it desires an extension of time, by posting a copy of the Commission's notice on all of its bulletin boards.

The Supreme Court of North Carolina has decided the suits which were brought before it to test the constitutionality of various acts of the last legislature. Dr. D. H. Abbott is declared to be a member of the Corporation Commission in place of E. C. Beddingfield. The court holds that the law creating the Corporation Commission abolished the name, but not the duties of the office of railroad commissioner.

The special commission appointed by Congress to investigate the cost of carrying mails on passenger trains held a session in New York last week and heard the testimony of Prof. Henry C. Adams, statistician of the Interstate Commerce Commission, and Mr. Julius Kruttschnitt, Vice-President of the Southern Pacific. Prof. Adams presented a long report embodying the results of an investigation which he had made. He gave statistics of the cost of carrying mails, passengers and freight for the past 25 years, has made. He gave statistics of the cost of carrying mails had been diminished more rapidly than the cost of carrying express matter, because the volume moved had much more largely increased. The rates

paid by the Government for transportation of mails have been reduced, but not in so large a proportion as Prof. Adams deems just, considering the reductions in other departments of transportation. He presented figures showing that rates for carrying mails long distances were relatively higher than for short distances, in comparison with freight and express rates. Prof. Adams suggested that mails other than first class should be carried as "fast freight" instead of being taken by passenger train.

Mr. Kruttschnitt gave facts tending to show that the mail traffic was not a source of exorbitant profit to the railroads. He dissented from the conclusion that the average haul of mail in this country is 328 miles. Mr. Kruttschnitt called attention to the very large proportion of second class matter now carried in the mails. The magazines often contain three pages of advertising to one page of reading matter. The railroads ought not to be compelled to carry advertising matter at the low rates prescribed for legitimate newspapers.

Fast Run on the Lake Shore and the Reading.

On Nov. 22 the fast mail train of the Lake Shore & Michigan Southern (train No. 3) was run from Buffalo to Cleveland, 183 miles, in three hours 25 minutes. The train consisted of eight heavy cars and it was drawn by a new Brooks 10-wheel locomotive, No. 601. This engine has cylinders 20 in. x 28 in., drivers 80 in. in diameter, weight on drivers 133,000 lbs., and steam pressure in the boiler of 200 lbs. per square inch. Three stops were made for water, consuming 14 minutes, and speed was reduced through five yards. The average speed, including stops, 53.5 miles an hour, is not regarded by the officers of the road as remarkable, as equally good time has been made with lighter locomotives. The newspaper report that, on this run, a distance of five miles was traversed in three minutes, appears to lack confirmation.

On Nov. 20 a train of the Atlantic City Railroad, consisting of 10 cars, is reported to have been run from Camden, N. J., to Atlantic City, 55.5 miles, in 47 minutes, an average of 70.8 miles an hour. It is said that the best time heretofore made over this road was 44 minutes with a train of five cars. The locomotive making the run of Nov. 20 was No. 1,028, a four-cylinder compound.

Export of Iron and Steel.

The October statement of exports of manufactures of iron and steel shows for October an increase of over $2,000,000 as compared with October of last year, and for the 10 months an increase of almost $20,000,000 as compared with the corresponding months of last year. The October figures of exports of iron and steel and manufactures thereof are $9,593,453, against $7,299,185 in October of last year, and for the ten months ending with October, $86,162,258 against $67,290,560 in the corresponding months of last year. The following shows the export of the principal articles of iron and steel in weight:

Articles.	Ten months ending Oct. 31. 1898.	1899.
Wire (lbs.)	134,842,261	219,085,962
Steel sheets and plates (lbs.)	48,450,494	109,304,669
Steel bars or rods (lbs.)	42,455,755	58,963,146
Wire nails (lbs.)	24,469,892	56,583,657
Bar iron (lbs.)	14,278,374	21,847,935
Cut nails (lbs.)	27,334,714	18,283,889
Iron sheets and plates (lbs.)	7,038,696	12,050,354
Pig iron (tons)	184,320	207,728
Structural iron (tons)	29,246	47,476

The following table shows the value of the principal articles of iron and steel for the same periods:

Articles.	Ten months ending Oct. 31. 1898.	1899.
Machinery, n. e. s.	$12,797,211	$15,293,015
Builders' hardware	5,731,224	7,306,721
Metal working machinery	4,742,488	5,522,864
Pipes and fittings	3,636,047	5,486,333
Wire	2,447,930	4,435,077
Locomotives	4,663,849	4,872,850
Sewing machines	2,320,196	3,231,399
Pig iron	2,003,046	2,560,439
Pumps and pumping machinery	1,809,167	2,466,014
Electrical machinery	1,934,474	2,454,510
Typewriters	1,714,325	2,318,011
Structural iron	1,112,778	1,776,617
Steel sheets and plates	622,727	1,609,873
Engines, other than locomotives	1,323,370	1,537,755
Wire nails	462,838	1,185,322
Steel bars or rods	511,164	853,145
Printing presses	662,491	785,087
Cut nails	497,423	380,822
Bar iron	182,913	363,787
Iron sheets and plates	144,201	300,989
Total iron and steel and manufactures	26,299,550	86,162,258

Tree Cultivation on the Big 4.

The Cleveland, Cincinnati, Chicago & St. Louis has set out 30,000 catalpa trees, with a view to growing timber for ties and fence posts. This plantation has been started on a tract of land in the central part of Indiana, which has been owned by the company for a number of years. The land has heretofore produced no revenue, so that the investment necessary to start the timber forest is comparatively small.

New Depots in the South.

Within the last three years the city of Montgomery, Ala., has had nearly $500,000 expended in new depots and terminals. The union station built by the Louisville & Nashville alone represented an outlay of $350,000, while the Western Railway of Alabama improved its facilities to the extent of $100,000. The Baltimore & Ohio, in completing Mount Royal Station and remodeling Camden Station at Baltimore, spent fully $300,000 in these improvements alone. At Fort Worth, Tex., a union depot has been erected at a cost of $200,000. Jacksonville, Fla. has also been benefited to the extent of $75,000 in the construction of a passenger and freight depot. The Southern Railway Co. has been especially noticeable in its appropriations for such work. The plan of rehabilitation has extended to its station buildings, and many have either been torn down and replaced by new structures or have been remodeled. Contracts have been let by this company for depots at Greensboro and Charlotte, N. C., each of which cost nearly $50,000; also at Danville, Va., and Knoxville, Tenn. The company intends building a depot at Richmond, which will be 75 x 170 ft. in dimensions with a tower 100 ft. high. The smaller contracts of the Southern include 15 stations, representing an outlay of nearly $50,000. It also spent about $5,000 in improving its station at Aiken, S. C.

The Louisville & Nashville has let contracts for a union station at Nashville, Tenn., which will represent an expenditure of fully $1,000,000, including the terminals. It has also contracted for a $10,000 station at Middlesborough, Ky., and may be interested in the union depot which is proposed at Atlanta, Ga. A number of new depots have been erected by the Louisville & Nashville at smaller towns along its lines. The Chesapeake & Ohio, in connection with the Seaboard Air Line, has begun work upon the union depot and terminals at Richmond, Va., which will cost fully $2,000,000. Two other very large contracts which will probably be let within the next year are the union depot at Atlanta, Ga., estimated to cost $500,000, and the improvements proposed by the Pennsylvania Railroad at Washington to cost $3,000,000, including a steel bridge over the Potomac River and elevated tracks within the city limits. The Choctaw & Memphis Ry. Co. is about to build a station at Little Rock, Ark., as its line is nearly completed to that city. The Missouri, Kansas & Texas is selecting a site for a depot which may be utilized by the railroads entering Waco, Tex. The estimated cost of this is $50,000. The Southern Ry. is understood to be considering an elaborate depot at Charleston, S. C., and has had plans prepared for a depot at Rome, Ga., to cost $50,000. New buildings are projected by the railroad companies for Bryan, Tex.; Waycross, Ga.; Durham, N. C.; Troy, Ala.; Valdosta, Ga.; Americus, Ga.; Opelika, Ala., and Summerville, S. C.

The building of the Richmond, Petersburg & Carolina Division of the Seaboard Air Line necessitates a new depot at Petersburg, Va., which will cost about $35,000; also 15 smaller stations at different points between Richmond and Ridgeway, N. C., for which contracts have been let. The same company has also planned a depot at Columbia, S. C. A union station at Mobile, Ala., is also under consideration. A consultation has been held at San Antonio, Tex., with the view of building a union depot in that city. The Missouri, Kansas & Texas is interested. A union depot has also been projected for Savannah, Ga.—The Manufacturer's Record.

Accident Liability—Prize Competition.

The International Association for Comparative Jurisprudence and Economics (Berlin) offers the Hilse prize of one thousand marks (foundation of Dr. Carl Hilse of Berlin) for the best work on the following subject: "The Legislation in regard to the Accident Liability of Railroads in the Most Important Countries of Europe: Its History and Economic Significance." The competition takes place under the following conditions:

1. Essays must be submitted before April 1, 1901, to the First Secretary of the Association Kammergerichtsrat, Dr. Kronecker, Berlin W., Kurfurstendarmm 241.

2. The essays must be written in German, French or English.

3. The essays should not be signed with the name of the author, but should be marked with an inscription and accompanied by a sealed envelope bearing the same inscription and containing the name and address of the author.

4. The committee of judges consists of the following members of the association: Dr. Jur. T. M. C. Asser, Staatsrat, The Hague; Dr. Georg Eger, Regierungsrat, Berlin; Dr. William Hewins, Director of the London School of Economics and Political Science, London; Dr. Friedrich Meile, Professor of Law, Zurich.

The amount of the prize may be divided among two or more essays. The publication of a work submitted, or of any part thereof, before the prize is awarded, excludes the work from the competition. The unsuccessful manuscripts must be recalled by the authors within one year after the announcement of the award. The property in the essay which receives the prize, especially the right of translation and publication, passes with the payment of the amount of the prize to the association. Further information may be had from Prof. H. C. Emery, Bowdoin College, Brunswick, Me.

Telegraphing 150,000 Words an Hour.

The rapid telegraph apparatus of Pollak and Virag, of which accounts have recently appeared in European papers, was last week tested in this country. Messrs. Pollak and Virag have come to America, apparently under arrangements with the Chicago Tribune and other newspapers. On the wires of the Western Union Telegraph Company between Chicago and Milwaukee, and also between Chicago and Buffalo, messages were sent at the rate of 122,000 words an hour, and in one of the tests the rate is said to have been 155,000 words an hour. This is a higher speed than had been reported in the tests between Buda-Pesth and Berlin. The apparatus is to be tried between New York and Chicago. The sending apparatus used in these tests appears to be similar in principle to that of other "rapid" methods; perforations, in the proper combinations, are made in strips of paper, and these strips are made to actuate the sending apparatus by being rapidly run through a pair of wheels. The receiving apparatus, which is as sensitive as a telephone, moves a mirror, after the manner of the receiving apparatus used on ocean cables, and the ray of light is thrown on a sensitized screen, so that the signals are photographed. Subsequently, the photographic message is written out, as is done with chemical telegraphs.

Cerro de Pasco Railway in Peru.

Ernest Thorndike of Lima has obtained a concession from the Government for a line to run from Oroya, the present terminus of the Central Railway of Peru, north about 80 miles to Cerro de Pasco. It will pass over the summit of the Andes at an average elevation of 13,000 to 14,000 ft. above sea level. The road is to be standard gage, with all necessary equipment. The Central Railway of Peru with which it is to connect, runs from Aroya, via Lima, to Callao on the coast, 138 miles. The concessionaire is completing plans, profiles, etc., to enable him to place the project before the public at the earliest possible date. (Official.)

American Couplers on the Bavarian State Railroads.

As a supplement to the paper by Mr. J. Philippe on automatic couplers we here give some information taken from the Organ für die Fortschritte des Eisenbahnwesens on a recent application of the Janney coupling by the Bavarian State Railroads. In this case, the drawbar and usual side buffers have been retained, so that vehicles can be joined between themselves by the Janney apparatus, and be joined to vehicles of other lines by the customary coupling screws. The Janney coupler is placed below the drawbar, and so arranged that a clear space of about $\frac{13}{16}$ in. is left between the buffer ends of two coupled up vehicles. It is fixed to channels which are bolted to the frame of the vehicle, and stiffened by angles and stays. The axis of the coupler is 2 ft. 7½ in. above the rail; the couplers are made of cast steel having a tensile strength of 40 kilograms per square millimetre (25.398 tons per square inch) and an elongation of 15 per cent.; there are double 10,000 kilogram (10 ton) springs, and those springs are subjected to an initial tension of 1,000 kilograms (1 ton). The Janney coupler is arranged very much as in America. The only differences are that the bars are longer, so as to allow for the greater amount of clearance, and that the edges of the heads have been rounded. Furthermore the movable hook is fixed on its axis of rotation, and is turned in the outward direction by a spring as soon as the catch is raised. The Bavarian State Railroads have fixed such couplers to five passenger carriages and 10 goods wagons, and used them experimentally for home traffic, with satisfactory results.—Bulletin of the International Congress.

South Side Elevated, Chicago.

On Oct. 18 this road completed the second full year of use of the Union Elevated Loop. The traffic for the two years is as follows:

	Daily average traffic.	Per cent. increase over previous year.
First year, 1897-98...	50,267	50.0
Second year, 1898-99.	60,155	19.7

The average for the first 20 days this month was 80,000, which, on account of the festival week, is not a safe basis for comparison. The October average last year was 58,198, including a festival week. The average for October this year will show an increase of about 20 per cent. over last year.

Chicago Street Paving.

Bids were opened by the Board of Local Improvements on Nov. 8 for street paving to cost about $380,000. Work on contracts to be awarded on these bids will not be done until next spring and the larger part of the pavements will be of asphalt. Bids for paving to cost $262,000 have also been asked by the Board for 24 streets, the contracts to be let this fall and work to be commenced next spring. The materials will be largely cedar and macadam, although a few brick and one granite pavement are included.

The Chicago Coliseum.

The site of the Coliseum Building, Chicago, is rapidly being cleared of the steel arches which fell August 28 (see pp. 617 and 638) and the masonry is being repaired. It is announced that the work will be completed by April 1 next, and that both of the national political conventions will be held in the new building in 1900.

Lake Notes.

A new conveyor at the Pioneer Fuel Co.'s docks at Duluth recently handled 210 tons of coal from four hatches in one hour, this being an average record for the whole cargo.

The Detroit Shipbuilding Co. is building a steel freight boat for the American Steamship Co. which will be a duplicate of the steamer Angeline recently built for the Presque Isle Transportation Co. and previously described in this column. The hull and lower works are already completed. The new boat is known as No. 133 and will be 435 ft. long, over all, 50 ft. beam and 28 ft. molded depth, and will have triple expension engines.

The Detroit Shipbuilding Co. is also to build two steamers for Eddy Bros. of Bay City and one for the Carnegie Co. during the winter, the work to proceed as fast as material can be obtained. A big Brown hoisting machine has recently been completed which is so placed as to operate between two of the new boats and greatly facilitate the work on them.

The New Cruisers.

Contracts for the six new 3,500-ton cruisers were awarded Nov. 27, one to each of the following firms: William R. Trigg, of Richmond, Va.; Lewis Nixon, of Elizabethport, N. J.; the Bath Iron Works, of Bath, Me.; the Union Iron Works, of San Francisco, Cal.; the Fall River Engine Company, of Braintree, Mass., and Neafie & Levy, of Philadelphia. All are to be built in accordance with designs of the Navy Department.

Plant of the National Switch & Signal Co.

The old National Switch & Signal Company plant at Easton was sold by the Union Switch & Signal Co., owners, to Fred Nesbitt, representing the Easton Foundry & Machine Co., on Sept. 15, 1899. The sale comprised all buildings, lands, engines, boilers, shafting, hangers, etc.

The Robert Fulton Memorial.

The Council of the American Society of Mechanical Engineers, at its meeting in Washington in May last, appointed a committee to report on the best way of suitably marking the grave of Robert Fulton and of suggesting means to accomplish the desired end. The committee, consisting of Messrs. Gus C. Henning, Charles Wallace Hunt and Henry H. Suplee, has sent out a circular, in which it is suggested a memorial monument be erected, and requests subscriptions of $5 each for defraying the cost of this work; but any amount larger or smaller than this will be acceptable. Remittance should be made payable to the order of F. R. Hutton, Treasurer, 12 West 31st Street, New York. It may not be generally known that the body of Robert Fulton now lies in Trinity churchyard, being interred in the Livingston family vault, and no monument or inscription marks his resting place.

Street Rails in Chicago.

An ordinance has been introduced into the city council and referred to the committee on railroads providing that grooved rails be laid on all street railroads within five years, and that such rails be laids whenever streets are repaved.

Notes on the Electric Roads of Boston.

At the October meeting of the New England Railroad Club, Gen. William A. Bancroft, Vice-President of the Boston Elevated Railway, gave an interesting address on the electric railroads of Boston, which is the largest system measured by mileage in the world. He said that if the surface tracks of the Boston Elevated Railway were strung out in a line of single track they would reach from Boston to about 15 miles beyond Philadelphia. About 6,000 people are constantly employed. Nearly 3,000 cars are owned by the company, and it takes about 40 acres of roofing to cover the cars when they are in the car houses. At the end of the last fiscal year

over 233,000,000 people were carried, and 42,000,000 of these travelled on free transfers. Another interesting point in his address was in regard to the emergency station of the company. At the station built at Bartlett Street, Roxbury, it has been found necessary to maintain an emergency crew. These men live the life of firemen and are on call at any time; they sleep in the upper part of the station and drop down a sliding pole when the alarm calls them into service.

South American Notes.

The Governor of the State of Para, Brazil, Dr. José Paes de Carvalho, announces that Para will grant a subsidy of $50,000 to a reliable company which will establish a new line of steamships between New York, Para and Rio de Janeiro. To this the general Government of Brazil will add a subsidy of $200,000.

Technical Schools.

Rensselaer Polytechnic Institute.—Mr. H. de B. Parsons, Consulting Engineer, of 22 William Street, New York City, delivered a lecture before the students of the Rensselaer Polytechnic Institute at Troy, N. Y., Nov. 22. The subject was "The Heating and Ventilation of Buildings."

Mr. Hiram F. Mills, Chief Engineer of the Proprietors of the Locks and Canals on the Merrimack River, of the class of '56 of the Rensselaer Polytechnic Institute, delivered a lecture on "The Filtration of Sewage and Water" before the students of that institution at Troy, N. Y., Nov. 23.

Cornell University.—The President, in his annual report, states that the total number of students enrolled last year in the undergraduate courses of Sibley College was 501, of whom 40 were college graduates. A comparison with previous years shows that the force of the increase in the entrance requirements has at last spent itself, the number of students being greater than any year other than 1892-93. The question of providing greater facilities in the school of mechanical engineering is again brought up, but will require a different solution than heretofore. The raising of the requirements for entrance was undertaken about six years ago, partly to relieve the pressure for space in the laboratories, shops and draughting rooms.

LOCOMOTIVE BUILDING.

It is reported that the Southern is in the market for a number of locomotives.

We understand that the Rio Grande Western is about ordering 10 locomotives.

The Pittsburgh Locomotive & Car Works are building three engines for the Ohio River.

The Manchester Locomotive Works are building one engine for the Bangor & Portland.

The locomotives for the Hocking Valley, noted in our issues of Nov. 10 and 17, will probably be ordered about Dec. 1.

The Buffalo, Rochester & Pittsburgh is said to have ordered 10 12-wheel freight locomotives from the Brooks Locomotive Works.

The Baldwin Locomotive Works have received an order for a number of Class H-4 consolidation engines. We understand the order is for 20.

The Chicago, Indianapolis & Louisville has ordered from the Brooks Locomotive Works the two passenger engines, noted in our issue of Nov. 10.

Newspaper dispatches state that President Walter of the Lehigh Valley said at a meeting of the Directors that the road would build at least 40 locomotives during the coming year.

Newspapers state that Col. Ivanoff and A. Knapp of St. Petersburg, representing the Russian Railway Commission, are in Pittsburgh to place contracts for locomotives for the Trans-Siberian.

The Cooke Locomotive & Machine Co. has taken an order from the Southern Pacific for 10 moguls. These are essentially the same in dimensions and details as the earlier order which the company filled for the Southern Pacific.

The Cincinnati, Hamilton & Dayton has ordered two 10-wheel freight engines from the Pittsburgh Locomotive Works. They will weigh 117,000 lbs., with 94,000 lbs. on drivers, and will have 18 x 24 in. cylinders. They are for April delivery.

The simple consolidation engine which the Cooke Locomotive & Machine Works are building for the New York, Ontario & Western will weigh 200,000 lbs., with 178,000 lbs. on drivers, will have 21 in. x 32 in. cylinders, 55 in. in diam. drivers, straight top wide firebox type of boiler, working steam pressure 200 lbs., 362 charcoal iron tubes 14 ft. 9 in. long and 2¼ in. outside diam., Carbon steel fireboxes 119½ in. long and 105 in. wide; tank capacity for water, 5,000 gals., and for coal, 10 tons. It will be equipped with Westinghouse-American air brakes, hammered iron axles, Sterlingworth brake beams, Cooke Locomotive & Machine Co.'s brake shoes, Thurmond couplers, Dressel headlights, Monitor injectors, N. Y., O. & W. metallic piston rod and valve packings, Coale safety valves, Houston sanding devices, Nathan lubricators, Ashcroft steam gages, Latrobe driving wheel tires, Catasauqua truck wheels, Griffin tender wheels. Two pairs of wheel centers will be cast iron and two pairs cast steel.

The order of the Norfolk & Western given to the Baldwin Locomotive Works, and referred to last week, calls for two compound consolidation and two simple 10-wheel engines. The former will weigh 185,000 lbs. with 165,000 lbs. on the driving wheels, and have 23 in. and 35 in. x 32 in. cylinders, radial stay boilers with 306 charcoal iron tubes 2½ in. in diam. and 14 ft. 6 in. long, and fireboxes, Carbon steel, 121 in. long and 41¾ in. wide; the 10-wheel engines will weigh 150,000 lbs., with 12,000 lbs. on the driving wheels, and have 19 in. x 28 in. cylinders, 56 in. driving wheels, radial stay boilers with 261 tubes 2¼ in. in diam. and 13 ft. 10 in. long, and fireboxes of Carbon steel, 112½ in. long and 41¾ in. wide. The specifications for both classes of engines call for a working steam pressure of 200 lbs., a tender capacity for 5,000 gals. of water and nine tons of coal, Westinghouse air brakes, National hollow brake beams, Tower couplers, Rochester headlights, Nathan injectors, Ashton safety valves, Leach sanding devices, Nathan lubricators, French springs, Ashton steam gages, Standard driving wheel tires and cast iron tender wheels.

Last week we stated that the Boston & Maine had ordered six shifting and eight passenger engines from the Manchester Locomotive Works. The road has also ordered six 10-wheel freight engines with 19 in. x 26 in. cylinders, and five 10-wheel passenger engines with 19 in. x 24 in. cylinders from the Rhode Island Locomotive Works. The locomotives ordered from Manchester are for April, May and June delivery. The eight-wheel passenger engines will weigh 115,000 lbs., with 77,000 lbs. on the driving wheels, and have 18 in. x 24 in. cylinders, 69 in. driving wheels, radial stay boilers with a working steam pressure of 185 lbs. and 267 charcoal iron tubes 2 in. in diam. and 11 ft. 8 in. long; fireboxes, of Carbon steel, 90 in. long and 41⅝ in. wide, and a tender capacity for 4,000 gals. of water and seven tons of coal. The six six-wheel shifting engines will weigh 100,000 lbs. and have 18 in. x 24 in. cylinders, 50 in. driving wheels, radial stay boilers with a working steam pressure of 150 lbs. and 168 charcoal iron tubes 2 in. in diam. and 13 ft. 9½ in. long; fireboxes, Carbon steel, 72 in. long and 35 in. wide and a tender capacity for 2,700 gals. of water and 3½ tons of coal. The specifications for all of the engines call for Westinghouse brakes, Midvale steel axles, Sterlingworth brake beams, Diamond S brake shoes, Gould couplers, Ashton safety valve, "She" sanding devices, Crosby steam gages and Midvale driving wheel tires. The passenger engines will have Nathan lubricators, French springs, Consolidated steam heat equipment and Standard truck and tender wheel tires; the shifting engines will have Scott springs.

The Illinois Central has ordered six 10-wheel passenger and six 10-wheel freight engines from the Rogers Locomotive Co., 14 10-wheel freight engines from the Brooks Locomotive Works and three freight and 10 switching engines from the Baldwin Locomotive Works. These are for June, July and August delivery. The passenger engines being built by the Rogers Co. will have 19½ in. x 26 in. cylinders, will burn bituminous coal, will have cast steel driving wheels 69 in. in diam. outside of tires, steel driving axles, and will weigh 144,500 lbs., with 109,000 lbs. on drivers, the driving wheel base being 13 ft. 3 in. and the total wheel base of engine 24 ft. 3½ in. They will have Belpaire boilers containing 264 tubes made of special I. C. brand iron 13 ft. 5 in. long, with an outside diameter of 2 in.; working steam pressure, 190 lbs. The engine truck wheels will be steel tired 36 in. in diam.; the tenders will have a capacity for 5,000 gals. of water and will be equipped with Fox pressed steel trucks with bolsters with steel tired wheels 36 in. in diam. The freight engines being built by the Rogers Co. will burn bituminous coal, will have 20 in. x 28 in. cylinders, cast steel steel-tired driving wheels, 63 in. outside diam. steel driving axles, driving wheel base 13 ft. 6 in., total wheel base 24 ft. 4 in.; weight, 164,400 lbs., with 123,900 lbs. on drivers; extended wagon top type boilers with 1 in. diam. radial stays containing 304 tubes of special I. C. brand iron 14 ft. long and 2 in. outside diam.; working steam pressure, 200 lbs. The engine truck wheels will be steel tired, 33 in. in diam.; the tenders will have a capacity for 5,000 gals. of water and will be equipped with Fox pressed steel trucks, with bolsters, and steel-tired wheels 36 in. in diam. The freight engines being built by the Brooks Works will weigh 157,200 lbs., with 122,300 lbs. on drivers. They will have 20 x 28 in. cylinders, 63 in. drivers, extended wagon top type boilers containing 304 charcoal iron tubes, 13 ft. 11⅜ in. long and with an outside diameter of 2 in., working steam pressure 200 lbs., steel fireboxes 120 in. long and 32¾ in. wide, tank capacity for water 5,000 gals. They will be equipped with Westinghouse-American brakes, nickel steel driving axles, Heginbottom bell ringers, Monarch brake beams, Thurmond couplers, Jerome piston rod and valve packings, Ashton safety valves, Leach sanding devices, Nathan lubricators, French springs, steel-tired truck and tender wheels.

CAR BUILDING.

The Erie Car Works are building 500 cars for the Pennsylvania.

Pullman's Palace Car Co. has an order for one dining car for the Chesapeake & Ohio.

The Chattahoochee Valley, now building, will want one passenger coach and five box cars.

It is reported that the Southern is in the market for a number of passenger and freight cars.

It is reported, but not officially, that the Laurel Hill Car & Coal Co., of Chicago, wants 100 cars.

The Delaware, Lackawanna & Western has ordered 50 ballast cars from the American Car & Foundry Co.

It is rumored that the Southern Pacific is considering some new passenger cars, but we have no particulars.

We understand that the Duluth & Iron Range is building at its Two Harbors shops some cabooses and 100 flat cars.

The American Car & Foundry Co. has received an order from the Lehigh Valley for 25 poultry cars and 31 caboose cars.

It is rumored that the Pennsylvania Railroad Company is ordering 1,500 cars of 100,000 lbs. capacity from the Pressed Steel Car Company.

We are reliably informed that the Minneapolis, St. Paul & Sault Ste. Marie is about to order the 600 box cars which we have previously noted.

The Wheeling & Lake Erie has ordered 500 freight cars from the American Car & Foundry Co., and it is reported that the road has 1,000 more under consideration.

The American Car & Foundry Co. has received orders from various companies, in addition to others noted elsewhere in this column, for a total of 100 freight and tank cars.

We are officially informed that the Kansas City, Memphis & Birmingham has made inquiries about the cars noted in our issue of last week, but has dropped the matter and does not intend buying at present.

The Chicago & Alton has placed an order with the American Car & Foundry Co. for 500 box cars for the Chicago & Alton and for 500 box cars, 200 flat cars and 200 furniture cars for the Kansas City, Pittsburgh & Gulf.

The Illinois Central will build 1,000 flat cars of 80,000 lbs. capacity at its Burnside shops instead of 500, as noted in our issue of Nov. 17. In addition to the details published then the cars will have Harrison dust-guards and Riley cast iron brake shoes.

In our issue of Sept. 29 we stated that the Wheeling & Lake Erie would probably order 1,000 cars in addition to the 1,000 to be built at its own shops. It is now stated that President Blickensderfer is in New York making arrangements for 1,000 cars.

On Oct. 6 and Nov. 3 we noted that the Wheeling & Lake Erie would order 12 passenger cars. This order has been placed with the American Car & Foundry Co., and we understand that it consists of six coaches, three combination cars and three parlor cars.

The Southern Pacific has placed an order with the Barney & Smith Car Co. for 28 cars for passenger service, three of which will be used on the Houston & Texas Central. The cars are to be 54 ft. long with mahogany finish. They will be equipped with Baker perfected heaters, Standard steel platforms and Pintsch gas.

The Ann Arbor has ordered 200 coal cars of 80,000 lbs. capacity from the American Car & Foundry Co., as noted last week. Beginning Jan. 14, 1900, these cars will be delivered at the rate of 10 per day. They will be 36 ft. long, 9 ft. 8½ in. wide and will, it is said, have metal under frames. The special equipment will include Westinghouse air brakes, Simplex bolsters, Sterlingworth brake beams, Scott Springs and Fulton Iron & Engine Works brasses.

As has been reported in the daily newspapers recently, overtures have been made to the American Car & Foundry Co. for supplying freight and passenger cars for the Trans-Siberian Railroad. The number given in the reports is 3,000 freight cars and 200 cars for passenger service, but we have reason to believe that the number will be larger. The State Railroads of France will need additional equipment and a representative has been deputed to visit this country to investigate facilities of the American car builders for turning out cars. Negotiations have been carried on with the American Car & Foundry Co.

The Jewett Car Co. has received an order for eight interurban cars for the equipment of the electric road being built from Greenfield to Indianapolis.

Two gentlemen from France, one of whom is Fernand Montague, are in this country intending to buy 20 motor cars and 30 parlor cars for an electric road in Egypt.

BRIDGE BUILDING.

AKRON, O.—The Council, according to report, has accepted the report of the Railroad and Bridge Committee for a bridge across the canal at Falor st.

ALAMEDA, CAL.—Nine bids were receiver Nov. 14 for the proposed drawbridge across the Tidal Canal at Fruitvale Ave. The lowest bid was by Darby Laydon of San Francisco, $57,438. The highest bid was $85,733.

BRYAN, TEX.—The Commissioners' Court have yet to let contracts for two bridges to replace those destroyed by the flood several months ago. Since that time 53 bridges have been rebuilt. An iron bridge will be built over the Little Brazos River.

CAMDEN, N. J.—The County Engineer and the Bridge Committee of the Camden County Board of Freeholders are considering the proposed bridge across Coopers Creek at Pine St.

CARTWRIGHT, MAN.—H. Lawe, C. E., of the Provincial Public Works Department, is considering plans and a sight for a bridge at this place.

CEDAR RAPIDS, IA.—Reports state that the B Avenue bridge will be replaced by a new structure at a cost of about $35,000. The present structure is closed to traffic.

CHARLOTTE, N. Y.—The matter of a bridge across the Genesee River in the village of Charlotte, to connect the towns of Greece and Ironduquoit is again under consideration. (April 14, p. 269.)

CHATTANOOGA, TENN.—The County Commissioners have let a contract to the Converse Bridge Co. of Chattanooga for a steel bridge over Crow Creek near Bridgeport. Bridges across Lively and Kirby Creeks were ordered built.

CHESTER, PA.—Reports state that the Philadelphia & Delaware County Electric Ry., in consideration of a franchise for an extension, offers to build a bridge to cost $20,000.

CHEYENNE, WYO.—The Union Pacific, according to report, contemplates building a steel bridge over Dale Creek.

CHICAGO, ILL.—The Chicago Burlington & Quincy has asked the city to modify its plans for a viaduct at Canal St. over the tracks in Sixteenth St. Some time ago it was agreed that this viaduct should be built by the railroad company, which was also to advance the city enough money to make the viaduct suitable for street railroad traffic, the city to reimburse the railroad for the expenditure. It was expected that the additional cost would be about $20,000, but when plans and specifications were prepared it was found that $50,000 additional would be needed. The matter is at present under consideration by the city and a decision is expected soon. The viaduct has been out of service for teams for many months and some relief is demanded.

The appropriation for the Bridge Department is exhausted and all bridge work, even for repairs, must stop unless Commissioner of Public Works McGann can collect about $14,700, which he says is due the department from several sources.

An ordinance is before the Councils requiring the Pittsburgh, Fort Wayne & Chicago, and its lessee, the Pennsylvania Company, the Pittsburgh, Cincinnati & St. Louis, the Chicago & Western Indiana, the Chicago & Grand Trunk, and the Union Stock Yards & Transit Company, respectively, to elevate the plane of certain of their railroad tracks in Chicago.

CLANDEBOYNE, MAN.—A new bridge will be built here by the Provincial Government.

CLEVELAND, O.—Plans are being made, according to report, for the proposed bridge on Holton St.,

to cross the Pennsylvania RR. James Ritchie, Chief Engineer, Department of Public Works.

COLUMBUS, O.—The proposed bridge over the Oleantangy River will be at the foot of Goodale St. We are told it will be built by the Franklin County Commissioners and be a steel structure about 200 ft. long. It will probably be a camel-back truss through single roadway, with a brick floor. It is not decided as to the width of the proposed bridge, but if it should be 22 ft. wide, the cost is estimated at $45,000; if 28 ft. wide, the cost is placed at $55,000. The County Commissioners will decide as to the width Dec. 2. Henry Maetzel, County Surveyor. (See also Dublin.)

DAPHNE, ALA.—A bridge will be built over Brick Yard Creek, near Daphne.

Baldwin County Commissioners will build bridges across Sandy and Mifflin Creeks.

A steel bridge will also be built across Loss Creek, at Carbon Hill.

DAVISVILLE, CAL.—The Supervisors of Yolo and Solano counties are considering plans for a new bridge over Putah Creek. W. O. Russell is County Surveyor.

DE LAMAR, IDAHO.—The Idaho Gold Mining Co. of Montreal, reports state, will build a steel bridge across the Snake River at Blue Lakes.

DENVER, COL.—Bids were received Nov. 29 on the substructure for rebuilding the bridge over Cherry Creek at South Fourteenth St. No date is set for receiving bids on the superstructure. It is an iron bridge about 250 ft. over all. The total work is to cost $12,000. Wm. B. Jones, Engineer, Board of Public Works.

DES MOINES, IA.—The City Council has ordered bridges at North Sixth St. across the Des Moines River, and at South East Sixth St. The probable cost of the two bridges will be about $140,000 complete. A tax levy has been made to provide for payment of the bridges. Work on the bridges will not be commenced before next summer. Address the Board of Public Works.

DUBLIN, O.—J. F. T. Judson, Corporation Clerk, Dublin, writes that the Franklin County Commissioners propose to build an iron deck bridge over the Oleantangy River at this place. (See also Columbus.)

EASTON, PA.—The Lehigh Valley has petitioned the Common Council for permission to build an iron bridge at Tenth St., over the railroad tracks, replacing a wooden structure.

FLOWING SPRING, PA.—Two bridges are wanted on the Flowing Spring branch of the Pennsylvania RR. C. A. Sims & Co., Harrison Bldg., Philadelphia, Pa., have the contract for building this branch.

GRAND FORKS, B. C.—Two bridges will be built here to cost about $6,000.

HARTLAND, B. C.—We are told that the bridge proposed over the St. John River is by the Hartland Bridge Co. It will be a wooden structure 1,200 ft. long, and is estimated to cost between $25,000 and $30,000. Bonds to cover the cost will soon be sold. S. S. Miller is Secretary and Treasurer.

HOUSTON, TEX.—The Missouri Valley Bridge & Iron Co. were awarded the contract at $16,700, for the bridge over the Colorado River at Columbus; and the Indiana Bridge Co. a contract at $9,776, for the bridge over the Colorado River at Red Bluff. The bids were as follows:

	On Columbus Bridge.	On Red Bluff Bridge.
Indiana Bridge Co.	$17,100.00	$9,776.00
E. P. Alsbury & Son	18,700.00	10,470.00
C. Q. Horton	18,325.00	10,165.00
A. M. Blodgett	18,990.00	10,700.00
Missouri Valley Bridge & Iron Co.	16,700.00	10,297.00
Morgan Rhoads	18,100.00	10,300.00
Geo. E. King Co.	18,797.00	11,000.00

HULL, QUE.—The E. B. Eddy Co. is about to build an iron bridge over Wright Bay.

KANDIYOHI, MINN.—Reports state that John Lundquist, Town Clerk, will receive bids for a new bridge.

LEXINGTON, MASS.—The Lexington & Boston St. Ry. Co. will build an underground crossing at the Boston & Maine railroad, near Bedford Road.

McKEES ROCKS, PA.—The Pittsburgh, Allegheny & McKees Rocks RR., recently incorporated by the Pressed Steel Car Co., will build a bridge over the Ohio River. (See Railroad Construction column.)

MONTREAL, QUE.—Bids are asked for building a subway under the Canadian Pacific railroad tracks at Delorimier, Que.

NEW BLOOMFIELD, PA.—The Grand Jury has reported in favor of a new county bridge over Big Buffalo Creek in Saville Township, Perry County.

NEW HAVEN, CONN.—The matter of a bridge over the Consolidated RR. at Bridge St. in the form of a petition before the Common Council. It will be an iron structure about 75 ft. long. (Nov. 24, p. 816.)

NEW HOPE, CAL.—The Sacramento & San Joaquin Valley will need several hundred feet of trestle and two small spans on an extension. (See RR. Construction column.)

NEWPORT NEWS, VA.—The Mayor in his message recommends a viaduct over the Chesapeake & Ohio RR. on Lafayette Ave.

NEW RICHMOND, MICH.—The Chicago & West Michigan Ry. has in consideration a new steel bridge across the Kalamazoo River near New Richmond, but no details have been decided upon.

NORRISTOWN, PA.—In connection with the new road in Upper Salford, a new bridge over the Perkiomen River is contemplated at a cost of $4,000. The stream at this point is 116 ft. wide.

PETERBOROUGH, ONT.—A new bridge will be built over the creek at Smith St.

PHILADELPHIA, PA.—Reports state that the Councils have $600,000 available for bridge work, and is considering what structures shall be built with this money as many bridges are required.

PLATTSMOUTH, NEB.—Cass County will receive bids in the first week in December for building all bridges required during 1900. James Robertson, County Clerk.

PLYMOUTH, PA.—It is proposed to build a bridge in connection with the plan to annex Hanover Township, now in consideration by the Council.

POTTSVILLE, PA.—Plans are being made, according to report, for the proposed overhead bridge across the Philadelphia & Reading and the Pennsylvania tracks.

Plans are being prepared, according to report, for a bridge from Center to George Sts.

RICHMOND, VA.—The Board of Public Works has decided that the Atlantic & Terminal Co. of Norfolk, to cross the tracks of the Norfolk & Western at Lambert's Point, must do so by means of an overhead bridge.

ROCKVILLE, CONN.—The town has in consideration a new iron bridge across the river near Vernon Depot to replace a wooden structure.

ROCKVILLE, MO.—A steel bridge will be built over the Osage River by Bates and Vernon counties at a cost of $5,000. Andrew B. Owen, Surveyor of Bates County, Butler, Mo.

ST. JOHN, N. B.—Weldon & McLean, barristers of this city, want tenders for the superstructure of a steel bridge to be built at Musquash, N. B., on the line of the Shore Line Ry.

SAN BERNARDINO, CAL.—The Board of Directors will reconsider the matter of the proposed bridge for which estimates were recently made. L. Allen, City Clerk.

SELMA, ALA.—The Louisville & Nashville has in mind a new bridge at Selma, though nothing definite has been decided.

SPRINGFIELD, MASS.—The County Commissioners are considering a plan for a new bridge across the New England tracks on St. James Ave. Mace Moulton is making plans for an iron truss bridge 120 ft. long and six ft. wide.

SOUTHAMPTON, ONT.—The old bridge over the Sangeen River near this place will be replaced at an early date by an iron structure, to cost about $20,000.

TOWANDA, PA.—The Bradford County Grand Jury has recommended a bridge across the Susquehanna River at Steven's Ferry in Wysox Township.

WICHITA, KAN.—W. E. Wood, County Clerk, Wellington, Sumner County, asks bids until Dec. 14 for 160-ft. bridge of two 80-ft. steel spans, with 144 ft. of piling approach over Ninescah River and a 304 ft. pile bridge at Darby's Ford; a 42 ft. steel span and a 42 ft. pile bridge over Spring Creek; a 42 ft. steel span with 48 ft. of piling approach, also a 90 ft. pile bridge over Prairie Creek; a 75 ft. pile bridge over Cowskin Creek. All roadways are 16 ft. wide.

Other Structures.

ALTON, ILL.—A new passenger station and freight warehouse is being arranged for by the St. Louis, Chicago & St. Paul, plans being well under way for both buildings. They will be of pressed brick with terra cotta trimmings and will afford facilities for increased trade for several years to come. Twenty-one acres of land have been bought upon which to locate these buildings.

ATLANTIC CITY, N. J.—Allen B. Rorke of Philadelphia has the contract to build a new hotel at Atlantic City, which will have an ocean frontage of 1,400 ft. It will be six stories high and be of fireproof construction. The Pencoyd Iron Co. will supply the steel.

BRIDGETON, N. J.—Doyle & Doak, Philadelphia, are receiving bids for a brick power house, 97 x 122 ft., to be built at Bridgeton, for the American Railways Company.

BROOKLYN, N. Y.—The Delaware, Lackawanna & Western has bought property in Cross St., Brooklyn, to increase its dock facilities in this city.

BUFFALO, N. Y.—Bids are wanted Dec. 6 for building a school building at Lovejoy and Gold streets as follows: Masonry, including iron-work, cut stone and plastering; heating and ventilating, including automatic heat regulation; roofing and metal work, including steel ceilings; fireproofing. R. G. Parsons, Secretary B. P. W.

The shops of the Wagner Palace Car Co. at East Buffalo will be enlarged.

CARBONDALE, ILL.—The Illinois Central has made extensive improvements in passenger depots along the old Cairo Short Line branch and the Paducah branch of the latter road. Several new buildings are in contemplation, the most prominent one being at Carbondale where the Southern Division headquarters are located.

CHICAGO, ILL.—The Rutland RR. last week completed the purchase of new docks for its freight steamers on the north branch of the Chicago River between Indiana and Erie Sts., and extending West from the St. Paul tracks to Kingsbury St. The price paid was almost $155,000. Plans have been prepared for a new warehouse five or six stories high and 257 x 50 ft., to be built as soon as the lease of the present occupants of the land expires on May 1. Meantime a one-story warehouse will be built for use early next spring, when the lease of the present docks of the road near the mouth of the river will expire. The new property has a river frontage of 418 ft., is 190 ft. deep and fronts 343 ft. on Kingsbury St.

EAST ST. LOUIS, ILL.—At a meeting of the East St. Louis Terminal Association in St. Louis, Nov. 21, it was decided to build a $25,000 new relay depot and begin the work some time this winter to have it ready for occupancy by early spring. The present relay depot was built in 1872. Clarence R. Parker, St. Louis Agent for the Illinois Central, is President.

FALL RIVER, MASS.—The American Thread Co. will build a thread mill at a cost of $2,000,000. Wm. Greene of Holyoke, Mass., is Supervising Engineer.

FORT DODGE, IA.—The proposed county court house and jail to be built at Fort Dodge, we are told, will cost about $100,000. It will probably be three stories high, 90 ft. wide and about 140 ft. long. Bids will be received in January. G. F. Rankin, County Clerk, Fort Dodge.

GRAFTON, W. VA.—A new station will be built at this place by the Baltimore & Ohio, RR.

HAZELTON, PA.—A factory will be built by the Hazelton Plush, Velvet & Silk Mfg. Co. The Hazelton Board of Trade may be addressed.

JACKSONVILLE, FLA.—The Jacksonville & Southwestern Ry. Co. is building large wharves on the St. Johns River.

KENSINGTON, PA.—Estimates are being taken by William Steele & Son, Philadelphia, for alterations and additions to the plant of the Arrott Mfg. Co., at the northwest corner of Coral and Taylor streets, Kensington. The plans embrace a four-story brick and iron addition to the mill building and the construction of a five-story brick and iron building.

MOLINE, ILL.—Reports state that officers of the Chicago, Burlington & Quincy were recently in Moline in regard to matters for a new depot in that city.

MORGANTOWN, W. VA.—Caldwell & Drake of Parkersburg, W. Va., are reported to have the contract for the new buildings for the West Virginia University at $76,000. (Oct. 20, p. 734.)

NEW HAVEN, CONN.—Reports state that designs prepared by Carrere & Hastings of New York, have been accepted by the Yale Corporation for the new University buildings.

NEW YORK, N. Y.—A fireproof building, six stories high, will be built by Chas. W. Hall, of 26 Cortlandt St., at Park Ave. and 130th and 131st Sts.

The Bush Co., Ltd., will soon build three new storehouses at the end of 42d St., in place of those destroyed by fire.

The Council has authorized bonds to the amount of $245,000 to pay for work to be done on new buildings for the Board of Education, at 59th St. and Park Ave.

Plans have been filed with the Building Department for buildings as follows: Seventh Avenue, northwest corner of 113th St., for a seven-story brick and stone apartment house, 100.11 x 95. Emil Block of 55 W. 88th St., owner; G. A. Schellenger, architect; cost, $150,000. Central Park West, 50.11 ft. south of 98th St., for a seven-story brick and stone apartment house, 50 x 88.9; Etta Blinn of 255 W. 116th St.; owner, G. A. Schellenger, architect; cost, $90,000. Catharine St., southeast corner of East Broadway, for a seven-story brick warehouse, 48.7 x 97.7 and 92.3; L. Levy of 31 East Broadway, owner; M. Bernstein, architect; cost, $50,000.

OAKLAND, CAL.—The Southern Pacific will soon begin work on new machine shops at West Oakland, plans for which have already been prepared.

PETERSBURG, VA.—The South Side Ry. & Development Co. will build a fireproof car shed at a cost of $30,000.

PHILADELPHIA, PA.—The Wolff Process Leather Co. will build some buildings north of Asylum Pike in the Thirty-fifth Ward, the total cost of which is about $60,000. Stearns & Castor are the architects.

PORTLAND, ORE.—Reports state that a car shed, to cost $60,000, will be built by the Northern Pacific Terminal Co. alongside the Portland Union Depot. It will be 600 ft. long and 110 ft. wide.

RICHMOND, IND.—The Richmond Traction Co., according to report, contemplates building a power house and converting the old power house on South Seventh St. into a car shed. The new building will be fireproof.

SANTA ANA, CAL.—Orange County has sold $100,000 of bonds for the proposed court house.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chestnut Hill.—Quarterly, 1½ per cent., payable Dec. 4.

Delaware & Hudson.—Quarterly, 1¼ per cent., payable Dec. 15.

Hocking Valley.—Preferred, 1½ per cent., payable Jan. 10.

Northern Pacific.—Quarterly preferred, 1 per cent., payable Dec. 5.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the Society, 220 W. 57th St., New York City, on the first and third Wednesdays in each month, at 8 p. m. C. W. Hunt, Secretary, 220 W. 57th St., N. Y. City.

American Society of Mechanical Engineers.—Meets at 12 W. 31st St., New York City, on the first Tuesday of each month from October to June, except December. F. R. Hutton, Secretary. The date set for the approaching convention is Dec. 5 to 8, 1899.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7.30 p. m. S. E. Tinkham, Secretary, City Hall, Boston.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield St., Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 10 a. m. Harry D. Vought, Secretary, 114 Fifth Ave., N. Y. City.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month. Arthur A. Skeels, Secretary.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 36 Jacobson Bldg., Denver, Colo., on the second Tuesday of each month except June, July, August and September. W. B. Lawson, Secretary.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth St., on the third Tuesday of each month, excepting July and August, at 6.30 p. m. J. F. Wilson, Secretary, P. O. Box 333, Cincinnati, O.

Engineers' Club of Columbus (O.)—Meets at 12½ North High St. on the first and third Saturdays

from September to June. H. M. Gates, 12½ N. High St., Secretary, Columbus, O.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month. H. E. Smith, Secretary, 1620 S. E. Fourth St., Minneapolis.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard St., Philadelphia, Pa., on the first and third Saturdays of each month at 8 p. m., except during July and August. L. F. Rondinella, Secretary.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth St. and Lucas Place, St. Louis, on the first and third Wednesdays in each month. Richard McCulloch, Secretary, 240 N. Spring Ave., St. Louis.

Engineering Association of the South.—Meets in the Berry Block, Nashville, Tenn., on the second Thursday of each month. H. M. Jones, Secretary, 1000 Broad St., Nashville.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building. H. J. Marsh, Secretary.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn Ave., Pittsburgh, Pa., on the third Tuesday in each month, at 7.30 p. m. R. A. Fessenden, Secretary.

Franklin Institute.—Meets at 8 p. m. on the third Wednesday of each month, except July and August, at 15 S. Seventh St., Philadelphia, Pa. Wm. H. Wahl, Secretary.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn St., Chicago.

Louisiana Enginering Society.—Meets on the second Monday of each month at 8 p. m., at 712 Union St., New Orleans, La. J. F. Coleman, Secretary.

Montana Society of Civil Engineers.—Meets in Butte, Mont., on the third Saturday in each month at 7.30 p. m. A. S. Hovey, Secretary.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month. Edward L. Janes, Secretary, P. O. Box 1158, Boston, Mass.

New York Railroad Club.—Meets at 12 W. 31st St., New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August. W. W. Wheatley, Secretary, 168 Montague St., Brooklyn.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul. T. A. Foque, Secretary, "Soo Line," Minneapolis, Minn.

Northwest Track & Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Railway Signaling Club.—Meets on the second Tuesday of January, March, May, September and November. C. O. Tilton, Secretary, C., M. & St. P. Ry., West Milwaukee, Wis.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m. H. H. Roberts, Secretary, 512 Commercial Bldg., St. Louis.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November. S. A. Charpiot, Secretary, Savannah, Ga.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market St., San Francisco, Cal., on the first Friday in each month, at 8 p. m. Otto Von Geldern, Secretary.

Texas Railway Club.—Meets on the third Mondays of February and August, at place and time chosen at the previous meeting. The next meeting will be held in Austin, Tex., in February, 1900. T. H. Osborne, Secretary, Pine Bluff, Ark.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, Ill., on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Western Railway Club.—Meets on the third Tuesday of each month except June, July and August, in the Auditorium Hotel, Chicago, Ill. J. W. Taylor, Secretary, 667 Rookery Bldg., Chicago.

Western Society of Engineers.—Meets in the Club rooms in the Monadnock Block, Chicago, Ill., on the first Wednesday of each month, except in January. Special meetings are held on the third

American Institute of Electrical Engineers.

The 137th meeting of the Institute was held at 12 West 31st Street on Wednesday evening, Nov. 22d. A paper was presented by Edward J. Willis on a "Test of a 300-Kilowatt Direct-Connected Railway Unit at Different Loads." The paper was discussed by Messrs. Hill, Mailloux and Sever.

The subject of "Possibilities of Wireless Telegraphy" was then taken up, the discussion being opened by Prof. R. A. Fessenden of the University of Western Pennsylvania, and continued by W. J. Clarke, M. I. Pupin and others.

A meeting of Western members was also held the same time at the Technical Club, Chicago.

American Institute of Architects.

The thirty-third annual convention of the Institute was held at Pittsburgh, Pa., Nov. 13 to 16 inclusive. The President said that seven U. S. Government buildings are being designed or built under direction of private architects instead of under the Supervising Architect of the Treasury Department, as formerly. A paper was presented by F. Rowland Hill, of the Westinghouse Electric & Mfg. Co., on "Electricity in Modern Buildings," which discussed in detail the electrical equipment of large buildings. A paper on "The Manufacture of Steel for Building Construction," by Mr. F. H. Kindl, Structural Engineer for the Carnegie Steel Co., was also presented. Papers on "The Legitimate Design of the Architectural Casing for Skeleton Steel Structures" were presented by Messrs. H. R. Marsh of New York and C. H. Blackall of Boston. Excursions were made to important plants, among them being the Westinghouse Air Brake Co., the Westinghouse Machine Co., the Westinghouse Electrical & Mfg. Co., the Carnegie Steel Co. and the Standard Mfg. Co. The following officers were elected for the ensuing year: President, R. S. Peabody, of Boston; First Vice-President, W. S. Eames, of St. Louis; Second Vice-President, Frank M. Day, of Philadelphia; Secretary and Treasurer, Glenn Brown, of Washington, D. C. The next annual meeting will be held in Washington, D. C.

American Society of Civil Engineers.

At a meeting of the Board of Direction held Oct. 31 it was decided that the Thirty-second Annual Convention of the Society shall be held in London. The time of holding the convention is yet to be fixed. Obviously, it will require careful study and organization, and members are asked to write to the Secretary giving their views as to the date and giving the reasons which govern them in their opinion.

At the same meeting of the Board it was decided that beginning with the year 1900 a sum not less than the amount of the entrance fees shall be applied every year to the payment of the loan now standing against the Society house.

The meetings of the Juniors of the Society for the season of 1899 and 1900 were inaugurated by a meeting on Oct. 25, the subject of the discussion that evening being "The Relation of Design to Durability."

At the meeting of Dec. 30 a paper will be presented by Mr. A. H. Sabin, Asso. M., on "Experiments on the Protection of Steel and Aluminum Exposed to Water."

At the meeting of Jan. 3 a paper will be presented by Mr. Allen Hazen, Asso. M., on "The Albany Water Filtration Plant." The November issue of the Proceedings contains Mr. Hazen's paper. This is a paper of 52 pages with many illustrations, and it is an admirable description in general and in detail of a very interesting work.

The same issue of the Proceedings contains a short discussion on "Counter Stresses in Railroad Bridges" and a much longer discussion on Mr. Haupt's paper on "Reaction Breakwaters."

The same issue contains a paper of 98 pages contributed by Mr. Charles H. Davis, member of the Society, in continuation of the discussion of the topic of "Electricity vs. Steam for Branch Railroad Lines," which discussion was begun at the annual convention. Mr. Davis makes a very detailed analysis of the subject. The conclusions which he reaches are printed elsewhere.

Western Railway Club.

The Western Railway Club met Tuesday afternoon, Nov. 21, at the Auditorium Hotel, Chicago. A paper,

Piece Work in a Railroad Shop,

by Mr. R. T. Shea, of the Chicago, Burlington & Quincy, was discussed; this paper was published in our issue of Nov. 17. All were not of the same opinion, but the advocates of piece work were able to answer the objections raised to that system, and those present were evidently much interested in the subject, as was shown by the unusual number of speakers; ordinarily the chairman is kept busy prodding the members to talk. The Chicago, Burlington & Quincy representatives all favored piece work and it is now used successfully in many of the shops of that road. While all seem to agree that the piece work system has many advantages where the same operation is repeated a great many times, many have doubted whether it could be adapted to the running repairs of locomotives and cars. However, Mr. F. A. Chase, General Master Mechanic of the Kansas City, St. Joseph & Council Bluffs, stated that they had gradually introduced piece work and were now doing the greater part of the car repairs and round house work in that way; also between 60 and 80 per cent. of the general repairs to locomotives was done by piece work. That the quality of the work is not very different is shown by the fact that it now takes no longer to break in a locomotive coming from the shop than when the men were paid by the day. Mr. Robert Miller, of the Michigan Central, had not been able to see sufficient advantage in piece work for repairs to warrant a change, but thought as good results could be obtained under the day system by the use of improved machinery. Mr. W. S. Morris, of the Chesapeake & Ohio, said their shop men were paid by the day and that with their records it was possible to know the cost of each piece of work. In the ordinary run of repairs, the cost of repairing the same parts had been found to vary so widely that no attempt had yet been made to adopt piece work. Very little new work was done in their shops.

Mr. M. E. Wells, of the Burlington & Missouri River Railroad in Nebraska, read a paper on

Pooling of Locomotives.

He showed that in a pool of 52 crews and 37 engines, which were started in 1893, there had been a decreased number of engine failures, greater mileage had been made and the oil and coal records compared favorably with those made where crews had regular locomotives. The methods of keeping account of the fuel and oil supplies and inspecting locomotives were fully explained. The discussion in the main was favorable to pooling.

PERSONAL.

(For other personal mention see Elections and Appointments.)

—The Governor of Mississippi has appointed Mr. J. C. Kincannon, of Lee County, Railroad Commissioner, succeeding Mr. J. J. Evans, deceased.

—Mr. Samuel Pullman died at his home in Chicago Nov. 20, aged 69. Mr. Pullman was born in England and has lived in Illinois since 1851. Formerly for many years he was Master Car Builder of the Chicago, Rock Island & Pacific.

—Mr. R. H. Soule, Western Representative of the Baldwin Locomotive Works, with headquarters at Chicago, has resigned from the service of that company and intends to return to railroad work. It is unnecessary for us to say a word to our readers about Mr. Soule's record, which is well known.

—Mr. Augustus Doerflinger died Nov. 24, in Brooklyn, N. Y., at the age of 54. He was a graduate of Cornell University, Class of 1871, and had spent most of his life in the employ of the Engineer Bureau of the War Department, U. S. A. He was conspicuous in the famous work of blowing up the Hell Gate rocks.

—Mr. Edgar Hill, Traffic Manager of the Louisville, Henderson & St. Louis, died at Louisville, Ky., Nov. 25, at the age of 56. Mr. Hill was a native of Richmond, Va., and at one time was General Freight Agent of the Cleveland, Columbus, Cincinnati & Indianapolis, now the Cleveland, Cincinnati, Chicago & St. Louis.

—Mr. F. C. Hills, General Manager of the Sioux City, O'Neill & Western, died Nov. 23. Mr. Hills was born in Bethersden, Kent Co., England, in 1842, and entered the service of the Chicago & Northwestern in 1864. In 1889 he became General Manager of the Sioux City & Northern and two years later President and General Manager of the same road. In 1894 Mr. Hills was Receiver for the S. C., O. & W.

—Mr. E. L. West, Assistant Superintendent of the Sixth Division of the Railway Mail Service has been promoted to be Superintendent of that division to succeed Mr. Lewis L. Troy, whose death we noted last week. Mr. West entered upon his new duties Nov. 21. He was born in Philadelphia in 1885 and went to Chicago in 1882, having been made a railway mail clerk in 1880. He was promoted several times and in 1889 became a post-office inspector at Chicago, resigning that position to become assistant to Mr. Troy, which position he has since filled.

—Mr. Ferdinand Hall, Chief Engineer of the Chicago, Indianapolis & Louisville, died of typhoid fever Nov. 22 at his home at LaGrange, Ill., a suburb of Chicago. Mr. Hall was born in New York State Oct. 14, 1855 and was educated at the University of Michigan. He became Chief Engineer of the Chicago, Indianapolis & Louisville in 1887, before which he was Bridge Engineer of the Chicago & Alton. Mr. Hall was a member of the Technical Club and a Trustee of the Western Society of Engineers, in which Society he has been for years an active and prominent member. The funeral services were held at his home Nov. 23. A special train from Chicago took a large number of his friends and associates from Chicago to the funeral, among them being the principal officers of his road and members of the Western Society of Engineers.

ELECTIONS AND APPOINTMENTS.

Chicago & Northwestern.—John M. Whitman, heretofore General Manager, has been appointed Fourth Vice-President, with headquarters at Chicago, Ill. Mr. Whitman will have general charge of the construction of proprietary roads and branch lines; also of the work of general improvements to the property of the company and of the management and development of its coal properties. William A. Gardner, heretofore Assistant General Superintendent, has been appointed General Manager, with headquarters at Chicago, Ill., succeeding Mr. Whitman. Effective Nov. 30.

Chicago Junction.—R. Fitzgerald, General Superintendent, will also assume the duties of Traffic Manager, with the title of Acting Traffic Manager, owing to the resignation of S. S. Whitehead.

Chicago, Milwaukee & St. Paul.—H. R. Williams, heretofore General Superintendent, has been appointed General Manager, succeeding W. G. Collins, resigned.

Choctaw, Oklahoma & Gulf.—C. B. Hart, heretofore Traffic Manager of the Hutchinson & Southern (Atchison, Topeka & Santa Fe), has been appointed Assistant General Freight and Passenger Agent of the C., O. & G., with headquarters at Oklahoma City, Okla. Ter.

Cleveland, Cincinnati, Chicago & St. Louis.—Richard Doyle, Trainmaster at Mattoon, Ill., has resigned.

Cleveland Terminal & Valley.—On Nov. 16 the following officers were elected: President, John K. Cowen, with headquarters at Baltimore, Md., succeeding T. M. King; Vice-President, F. D. Underwood, with headquarters at Baltimore, Md., succeeding S. T. Everett; Secretary, James Bartol, with headquarters at Cleveland, O.; Treasurer, J. V. McNeal, with headquarters at Baltimore, Md., succeeding F. E. Rittman. Geo. W. Booth has been appointed Auditor, with headquarters at Baltimore, Md.; and E. H. Bankard has been appointed Purchasing Agent, with headquarters at Baltimore, Md. Effective Dec. 1.

Deckerville, Osceola & Northern.—E. A. Smith having resigned as General Freight Agent, F. C. Fletcher has been appointed General Freight Agent and Auditor.

Denver & Rio Grande.—W. M. Lampton has been appointed Assistant General Freight Agent.

Findlay, Fort Wayne & Western.—Chas. Hine, General Superintendent, with headquarters at Findlay, O., has resigned.

Fitchburg.—F. B. Shepley has been appointed Purchasing Agent, succeeding G. J. Fisher, resigned.

Illinois Central.—F. B. Bowes, General Freight Agent at New Orleans, La., has been transferred to Louisville, Ky., as General Freight Agent, succeeding W. D. Hurlburt. W. M. Rhett, heretofore Assistant General Freight Agent, has been appointed General Freight Agent at New Orleans, La., succeeding Mr. Bowes.

Kansas City & Northern Connecting.—At a meeting of the stockholders, J. Lambert of Chicago was elected Chairman of the Board, Alfred Clifford Vice-President and C. G. Gates Secretary and Treasurer.

Kansas City, Fort Scott & Memphis.—Samuel J. Crawford of Baxter Springs, Kan., has been elected a Director.

Minneapolis, St. Paul & Ashland.—The officers of this company referred to in the Construction column are: President, S. G. Cook; Vice-President, Thomas Bardon; Secretary and Treasurer, A. S. Porteous. The directors are: Edwin Ellis, J. W. Cochran, S. S. Fifield, L. B. Egan, J. S. Porteous of Minneapolis; Thomas Bardon, S. G. Cook, J. W. Perley of St. Croix Falls, Wis.; R. L. McCormick of Hayward, Wis. The central office is at Ashland, Wis.

Pennsylvania.—N. M. Hench, heretofore Assistant Supervisor of Osceola, Pa., has been transferred as Assistant Supervisor of the Amboy Division, with headquarters at Bordentown, N. J., succeeding R. Silvis, transferred.

Pittsburgh Junction.—J. K. Cowen, President of the Baltimore & Ohio, has been elected President, succeeding T. M. King.

Plant System.—At a meeting of the stockholders of the Charleston & Savannah and the Green Pond,

Walterboro' & Branchville, subordinate lines of the P. S., C. S. Gadsden was elected President.

St. Louis Southwestern.—P. H. Coombs is General Eastern Freight and Passenger Agent, with headquarters at Tradesmen's Bldg., Pittsburgh, Pa., and S. C. Yeaman is Commercial Agent, with headquarters at Equitable Bldg., Atlanta, Ga.

Santa Fe Pacific.—G. W. Smith has been appointed Master Mechanic, with headquarters at Albuquerque, N. M.

Southern Pacific.—V. M. Cayne and E. H. Pardee have been elected Directors, succeeding W. H. Crocker and E. Searles.

Virginia & Southwestern.—T. R. Shanks has been appointed Master Mechanic, succeeding J. King.

Wheeling & Lake Erie.—F. H. Alfred, heretofore Engineer Maintenance of Way of the Cleveland, Akron & Columbus (Pennsylvania Lines), has been appointed Engineer Maintenance of Way of the W. & L. E., with headquarters at Canton, O.

The headquarters of J. N. Merwin, Superintendent, will, about Dec. 1, be removed from Toledo, O., to Massillon, O.

RAILROAD CONSTRUCTION.
New Incorporations, Surveys, Etc.

ALASKA ROADS.—The Home Transportation Co. of Seattle, Wash., has been incorporated in that city, with a capital stock of $300,000, to build a railroad in Alaska. The incorporators are: W. H. Gorham and Richard Chilcott, Seattle, Wash.

ATCHISON, TOPEKA & SANTA FE.—The Hanover line from San Jose, N. M., to Hanover mines, all in Grant County, 6.64 miles, is completed. (Official.)

BALTIMORE & OHIO.—The branch in Barbour County, W. Va., for which Wade, Burns & Co. of Baltimore have the contract, to be known as the Hockins Run Branch, is from a point on the main line two miles from Philippi, to run down the valley of Hockins Run to new coal fields. (Nov. 17, p. 800.)

BANGOR & PORTLAND.—Press reports state that the line recently built about two miles out from Nazareth, Pa., is to be extended southwest about 10 miles more through Bath to Siegfied, on the Central of New Jersey. (Oct. 6, p. 701.)

BOISE, NAMPA & OWYHEE.—The line now runs from Nampa, Idaho, south via Guffey, 25 miles, to Murphy, 31 miles. It is proposed to make a further extension from Murphy south about 175 miles to Winnemucca, Nev., on the Southern Pacific. For this extension no surveys as yet are made. (April 14, p. 271.)

On the extension from Nampa, Idaho, northeast 400 miles via Emmett, Horseshoe Bend and Salmon City, Idaho, Butte, Mont., the section from Nampa to Emmett, 27 miles, is under contract to J. J. McDonald of Nampa. (Sept. 29, p. 685.) Grading is completed on this contract from Nampa to Boise River, nine miles.

Another extension is proposed from Horseshoe Bend north 200 miles to Lewistown, Idaho, for which as yet no surveys are made. (Official.)

BURLINGTON, CEDAR RAPIDS & NORTHERN.—Surveys are in progress for a line from Germania, Ia., to run northeast about 50 miles to Albert Lea, Minn. It is probable that the line will be built to that point, connecting the northwest branches with the main line. The company, however, has no intention of extending the line on from Albert Lea to Minneapolis, as has been reported. (Official.)

CANADIAN PACIFIC.—Surveys are reported in progress for an extension from the main line at Spences Bridge, B. C., to run southeast, via Nicola, Lake Princeton and the Similkameen River to Kereneos.

The road-bed is reported finished ready for rails from Lardo, B. C., to Duncan City, 12 miles, on the Arrowhead & Kootenay extension from Arrowhead, B. C., southeast up Fish River, and thence along Trout Lake and Lardo River to a point near Argenta. Clearing is completed beyond Duncan City to within a few miles of Trout Lake. (Oct. 6, p. 701.)

CANE BELT.—The company has completed its line from Eagle Lake, Tex., northeast 17 miles via Beard to Sealy, on the Missouri, Kansas & Texas. (Oct. 20, p. 737.)

On the extension from Bonus, Tex., south 75 miles via Egypt, Bismarck, Wharton, Bay City to Velasco (June 30, p. 482), the nine miles to Bismarck have been graded by the Cane Belt Construction Co., and the company expects to begin track laying in 30 days. (Official.)

CARSON & COLORADO.—Preliminary surveys are reported in progress for an extension from Keeler, Cal., south about 75 miles to Johannesburg, the northern terminal of the Randsburg. This would make a new connecting line between the Central Pacific and the Gulf, Colorado & Santa Fe.

CHATTAHOOCHEE VALLEY.—Grading is to be completed by Dec. 15 as far as Beulah, seven miles, on the extension from Riverview, Ala., southwest nine miles via Beulah to Mechanicsville. Track laying is to be begun Dec. 1. Brooks & Sons of West Point, Ga., have the contract. (Oct. 13, p. 719.)

The company also proposes to build from West Point, Ga., north up the Chattahoochee Valley 30 miles. (Nov. 17, p. 800.) Surveys are completed and grading is to be begun in January. (Official.)

CHICAGO & ALTON.—An officer writes that the company is not laying new 90-lb. rails and rebuilding two bridges in the vicinity of Alton, Ill., as recently reported. (Nov. 17, p. 800.)

CHICAGO & NORTHWESTERN.—A circular from the Passenger Department gives the following new mileage, which will be in operation Jan. 1.: On the C. & N. W. proper, from Kirkman, Ia., to Harlan, 6.3 miles; from Burt, Ia., to Sanborn, Minn., 92.7 miles; from Wall Lake, Ia., to Mondamin, and from Boyer, Ia., to Denison, 86.1 miles; from Sanborn, Minn., to Vesta, 26.4 miles; from Mankato, Minn., to New Ulm, 24 miles; from Wabeno, Wis., to end of track, 5.23 miles beyond Laona, 14.92, making a total for the C. & N. W. proper of 250.42 miles. On the Chicago, St. Paul, Minneapolis & Omaha new lines are to be completed from Madelia, Minn., to Fairmont, 29.33 miles, and from Bingham Lake, Minn., to Jeffers, 18.87 miles. This makes a total for the entire system to be built during the year of 298.62 miles.

The extension from Sanborn, Minn., northwest 26.4 miles to Vesta, is to be opened Nov. 27. (Oct. 13, p. 719.)

The Minnesota & Iowa extension from Burt, Ia., to Sanborn, Minn., 92.7 miles. (Sept. 1, p. 619), and the Wisconsin & Northern extension from Wabeno, Wis., north 14.92 miles (June 30, p. 482) are completed and in operation.

On the Mankato & New Ulm extension from Mankato to New Ulm, 24 miles, grading and bridging are nearly completed and 15 miles of track is laid. (June 30, p. 482.)

Grading is in progress on the Boone County cut-off from Boone, Ia., across the Des Moines River to Ogden, 7.4 miles. Winston Bros. of Minneapolis rave the contract for grading, and Widell & Co., of Mankato, Minn., for masonry. (Nov. 10, p. 787.)

Work is practically completed on the second tracks from Boone, Ia., to Ontario, 8.9 miles; from Tama to Lamoille, 24.3 miles, and from Missouri Valley to Council Bluffs, 21.5 miles. All will be in operation by Dec. 10. Winston Bros. of Minneapolis have the contract. (Official.)

Grading is reported completed on about 2½ miles of additional track in the Clinton, Ia., yards, and the company is waiting for ties and rails.

CHICAGO GREAT WESTERN.—The company has bought 20 acres of land adjoining the 48th St. yard in Chicago, and is laying 10 miles additional track.

There is no truth in the report (Nov. 17, p. 800), that surveys are being made for a spur of about four miles near Des Moines, Ia. (Official.)

CHICAGO, ROCK ISLAND & PACIFIC.—Location is completed for the branch to be built by this company and the Atchison, Topeka & Santa Fe from Chickasha, I. T., to Pauls Valley, on the Atchison. (Nov. 17, p. 800.) Work will probably be begun soon and the grading completed during the winter. (Official.)

CORSICANA & SOUTHEASTERN.—Captain F. C. Hand of Corsicana, Tex., is reported surveying for this proposed line from Corsicana, Tex., southeast about 220 miles to Sabine Pass. (Nov. 24, p. 819.)

COLUMBIA & COVELLO.—This company was incorporated in Washington Nov. 16, with a capital stock of $300,000, to build a railroad over a route not given. The main office is at Dayton. The incorporators are: J. A. Thronson, C. J. Thronson and J. A. Turner.

COLORADO & SOUTHERN.—Over four miles of track is reported laid on the extension from South Platte, Col., south up the South Platte River. (Nov. 24, p. 819.)

DUBUQUE & OMAHA.—This company has been organized at Dubuqe, Ia., to build a railroad from that city southwest across the State to Omaha, Neb. Engineers have been engaged to make surveys.

FAYETTE & MARION.—This company has been incorporated in West Virginia, with a capital stock of $50,000, to build a railroad from some point along the Fairmont, Morgantown & Pittsburgh line of the Baltimore & Ohio to Fairmont. The incorporators are: A. Plummer Austin, John S. Christy, Thomas H. Hudson, Horatio S. Dunbar and Isaac Hunt, all of Fayette County, Pa.

FORT SMITH, POTEAN & WESTERN.—This company was incorporated in West Virginia Nov. 22, with a capital stock of $250,000, to build and operate railroads in Kansas. The principal office is at Topeka, Kan. The incorporators are: C. J. Devlin, F. E. Wear, W. S. Wear, J. L. Christopher and J. D. Norton, all of Topeka, Kan.

FORT WORTH & RIO GRANDE.—Preliminary surveys are reported under way for an extension from Brownwood, Tex., south 175 miles to San Antonio. (July 7, p. 499.)

GEORGETOWN & MARION.—Application is to be made to the General Assembly of South Carolina at its next session, for a charter to build this line from Georgetown north about 55 miles to Marion, on the Atlantic Coast Line. It is to be built by the Atlantic Coast Lumber Co. of Georgetown. The incorporators are: Lewis A. Hall, Wallace B. Flint, Waterman A. Taft, Robert L. Montague, L. R. Timmerman, F. Rhem and F. J. Saxe.

GEORGIA NORTHERN.—Grading is completed for seven miles and track laid 1¼ miles on the extension from Doe Run, Ga., northwest 23 miles to Albany. All the grading is completed on the tenth to the thirteenth miles, and partially completed on the eighth and ninth, and fourteenth and fifteenth miles. Hammond & Davidson of Thomasville, Ga., have the contract for the grading and timber work. There are 50 men grading. (Nov. 17, p. 800.)

Grading and track laying are completed for 1¼ miles on the extension from Moultrie, Ga., southwest about 30 milecs to Thomasville. (March 3, p. 161.) None of this extension is under contract. (Official.)

GREAT NORTHERN (CANADA).—J. M. Shanley, Chief Engineer, is reported as stating that grading will be completed in a few days on the two new sections from Shawenegan, Que., west 53 miles to Montcalm, and from St. Jerome west 35 miles to Hawkesbury. The middle section between Montcalm and St. Jerome, 28 miles, has been practically rebuilt. Eight miles of rails are relaid, ties renewed and culverts and trestles rebuilt. Track laying was begun toward the end of August, and, including the renewed section, there are 60 miles of rails laid. The section between St. Jerome and Lachute is about completed. At the end of the season there will remain only the section between Lachute and Hawkesbury, and between the Maskinonge River and Rivère du Loup. About 16 miles of ballasting is completed east of Montcalm, and a regular train is running over the old line and to a point 14 miles beyond Montcalm. The superstructure of the Hawkesbury bridge will be begun about Dec. 15 and the contractors must have the false work removed before ice breaks up in the spring. Among the smaller bridges are those over the Maskinonge and Rivère du Loup, each 1,000 ft.; the East Yamachiche, 500 ft.; the Chicots, 350 ft., and the West Yamachiche, 250 ft. (Nov. 3, p. 769.)

INTEROCEANIC OF MEXICO.—The annual report states that building has been going on slowly on the new link from Cuautla, State of Morleos, to run southeast 39¼ miles to Atencingo, on the Matamoras branch. It was proposed at first to remove the last 10 miles of track on both lines connected, so as to reduce the cost of the new line to £30,000, but it was found that giving up these sections would involve the return to the Government of the subsidies paid to the builders. It is estimated, however, that the new line will not cost more than the sum named. By this new line the distance from Zacatepec to Vera Cruz will be 87½ miles shorter than via Mexico City. (Nov. 18, 1898, p. 838.)

IOWA CENTRAL.—Trains are being operated on the extension from Belmond, Ia., northwest 37.8 miles to Algona. Thorough ballasting with gravel will be completed by Nov. 30. (Oct. 27, p. 753.) The towns on the line are as follows: Kanawha (new), Corwith (crossing of the Minneapolis & St. Louis), and St. Benedict. (Official.)

JEFFERSON & NORTHWESTERN.—This company was incorporated in Texas Nov. 15, with a capital stock of $20,000, to build the proposed railroad from Jefferson, Tex., northwest about 20 miles to a point near Linden. The incorporators are: E. Bancker, Jackson, Mich.; M. S. Clark, Dallas; J. R. Darnell, Jefferson, and others. (Nov. 17, p. 800.)

KENTUCKY WESTERN.—In addition to the facts given last week (p. 819) as to this line now building from Dixon, Ky., via Clay, and Wheatcroft to Blackford, 18½ miles, an officer writes that contracts are to be sub-let for trestling, bridges, depots, water stations, etc. Track laying is to be begun early in December. All the grading is completed except about two miles, which is to be finished about Dec. 10.

LOUISVILLE & NASHVILLE.—Dunn & Lallande of Birmingham, Ala., are reported to be grading a spur track from Toccoa, Ala., on the Birmingham Mineral, a few miles south of Birmingham, to run to Echols ore mines. (Nov. 17, p. 800.)

The Lonview (Ala.) Lime Co. is reported grading a 2½ mile branch from the L. & N., to its lime works.

MINNEAPOLIS, ST. PAUL & ASHLAND.—At the annual meeting held at Ashland, Wis., Nov. 24, it was decided to build the road through to Superior. It was built from Ashland, Wis., southwest about 25 miles to the Duluth, Lake Shore & Atlantic, and was planned to be extended on to St. Paul and Minneapolis. The officers are given under Elections and Appointments. (Feb. 26, 1897, p. 157.)

MISCELLANEOUS COMPANIES.—The United States Improvement Co. was incorporated in New Jersey Nov. 21, with a capital stock of $100,000, to build railroads, etc. The incorporators are: John B. Hudson and Harry C. Nichols, Philadelphia; Mahlon V. Booskirk, Camden.

MISSING LINK.—Preliminary surveys are reported begun on this line projected from Chattanooga, Tenn., east about 150 miles to Walhalla, S. C., on the Southern. W. L. Albright of Chattanooga, is President. (Nov. 17, p. 800.)

MISSOURI PACIFIC.—An officer writes that the St. Louis, Iron Mountain & Southern is neither surveying nor building an extension from Conway, Ark., east to Beebe, as reported. (Nov. 17, p. 801.)

MONTANA.—Grading and track laying are completed to Martinsdale, Mont., 20 miles, on the extension from Summit northeast 44 miles, via Martinsdale to Merino. Cook & Woldson of Helena, Mont., have the contract for the grading and bridging. Dean & Master of Bozeman, Mont., supply the ties. (Oct. 20, p. 737.) There are about 100 teams at work. (Official.)

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Surveys are in progress for the extension of the Bon Air branch to mine No. 7, in Blue Spring Cove, Tenn., about 1½ miles. Nothing definite is as yet decided upon. (Aug. 11, p. 575.)

NEW YORK, NEW HAVEN & HARTFORD.—An officer writes that there is no intention, so far as at present known, to build a second track, as reported, between New Haven, Conn., and Derby Junction. (Nov. 17, p. 801.) There has been some talk of a second track on the Naugatuck Division from a point about five miles north of Naugatuck Junction to Ansonia, but even this is undecided.

Twenty new side tracks are to be laid at South Worcester, Mass., without delay, according to report, to meet the demands of freight traffic.

NORFOLK & WESTERN.—On the cut-off on the main line near Radford, Va., from Back Creek to Crab Creek, 7.2 miles, grading is well under way, rapid progress having been made during the past three months. Of the 3,300 ft. of tunnel required, 1,300 ft. is completed. Walton, Luck & Co. of Falls Mills, Va., have the contract and the company expects to have the line completed by June, 1900.

Surveys are completed for the branch from Radford, Va., southeast about 25 miles to Floyd C. H. It is not determined whether the line will be built. An independent company was organized a few months ago to build a branch in this direction to connect with the main line. (May 19, p. 360.)

No building has been done as yet on the extension from Damascus, Va., to Shady Valley. This project is under an independent company. (July 21, p. 531.)

The company is building some side tracks along the main line near the Etna furnace at Ironton, O. (Nov. 17, p. 801), but the work is of small importance. (Official.)

NORTH ARKANSAS & WESTERN.—The Arkansas Construction Co. of Little Rock, Ark., is reported grading this line from Fayetteville on the St. Louis & San Francisco, to run west about 30 miles to the Kansas City, Pittsburgh & Gulf. W. A. Bright of Fayetteville, is General Manager.

NORTH CAROLINA ROADS.—Track laying is completed on the line of the Cleveland Cotton Mills Corporation of Lawndale, N. C., from Shelby north 12 miles to Lawndale. (Nov. 3, p. 769.)

NORTH CENTRAL.—This company has been incorporated in Arkansas, with a capital stock of $100,000, to build a railroad from Winnerva, in Baxter County, 10 miles south of Mountain Home, to run west 50 miles to Oregon, in Boone County, six miles north of Harrison. The incorporators are: W. E. Winner, Clarence E. Pond, G. J. Kensenger, H. C. Pert, C. B. Leavel and F. O. Hadley, Kansas City; Jerry C. South, Mountain Home; W. R. Jones, J. C. Floyd and Ambrose Estes, Yellville.

NORTHERN PACIFIC.—The company has completed nearly all the grading on the Clearwater Short Line from Potlatch, Idaho, east 63 miles via Clearwater Valley, to the south fork of Clearwater River. Track is laid from Potlatch to Oro Fino, 30 miles. Wrenn & Greenough have the contract. (Oct. 20, p. 737.)

Grading is in progress on the cut-off from the main line near Palmer, Wash., west 22 miles to Auburn. Henry & Bennett of Seattle, Wash., have the contract. No track is laid as yet. (Official.)

NOVA SCOTIA SOUTHERN.—The report of A. Hitchell of Shelburne, N. S., Chief Engineer, to R. G. Hervey, President, on Nov. 14, states that the heaviest portion of the 96 miles now building is at the New Germany end, where, about a mile from the junction with the Central Ry., the line crosses the gorge through which flows the La Have River, and then cuts through the hills on the western side of the river. The track is carried over four steel spans on granite piers, 45 ft. high. Of this the substructure is completed and the spans are building. The track is laid from the Central Ry. to the bridge and can be laid for 20 miles beyond as soon as the bridges, including four other spans between New Germany and Caledonia, are in place. The next heaviest section is the nine miles beginning at Shelburne at the southern end and across the valley of the Jordon River. The earth and rock work on this section is about half done and is being completed by Wheaton & Sons, who have a sub-contract for 15 miles. The entire 96 miles is under contract to C. B. Wilkins & Co., to extend from the Central Ry. at New Germany, N. S., southwest to Shelburne, an ocean harbor, with a branch of 19½ miles to Liverpool. This Liverpool branch is being built by Tupper & Minard, sub-contractors, who are vigorously pushing the grading. The road is to be ultimately extended to Halifax. (Nov. 24, p. 819.)

OMAHA NORTHERN.—Railroad contractors have been inspecting the right of way for this line from Sioux City, Ia., to Omaha, Neb., about 92 miles. The estimated cost is $2,500,000. (Aug. 25, p. 603.)

PACIFIC & IDAHO NORTHERN.—Grading is reported practically finished to Council Valley, 65 miles, on this line from Weiser, Idaho, north 192 miles to Lewiston. The company expects to have track laid to Council Valley by Jan. 1. There are 2,000 men at work. Lucius G. Wilkinson of Weiser, Idaho, is interested. (Oct. 13, p. 719.)

PENNSYLVANIA.—C. A. Sims & Co., Harrison Bldg., Philadelphia, have the contract for a main branch, with several spurs, in Blair County, Pa., to run from Flowing Spring to Turkey Valley. (Nov. 17, p. 801.) There are two bridges required. (Official.)

An officer confirms the statement that small additions are being made to the sidings at Columbia, Pa. (Nov. 24, p. 819.)

PHILADELPHIA & READING.—An officer writes that the double track on the Lebanon Valley branch is to be between Robesonia, Pa., and Myerstown. There are no contracts. The work is mainly track laying and is now in progress. (Nov. 17, p. 801.)

PITTSBURG, ALLEGHENY & McKEES ROCKS.—This company has been incorporated by he Pressed Steel Car Co. to merge three proposed lines into one connecting the company's works at McKees Rocks, Pa., with Allegheny and Pittsburgh. The charter also includes a bridge to span the Ohio River. The three companies incorporated are the North Shore Terminal, which was incorporated Nov. 30, 1898, to build a connecting line in Allegheny City. (Dec. 9, 1898, p. 885): the Pittsburg & Allegheny, which was incorporated in June, 1899, to connect the two named cities, and the McKees Rocks, which was incorporated Aug. 10, 1899, to run from McKees rocks to the Ohio River. (Aug. 18, p. 589.) Chas. T. Schoen of Bryn Mawr, Pa., is President, and E. A. Schoen of Sewickley is General Manager.

RIO GRANDE WESTERN.—The Carbon County RR. was incorporated in Utah Nov. 20, with a capital stock of $660,000, to build extensions of the Rio Grande Western from Scofield Station, Utah, south seven miles via Clear Creek to the Pleasant Valley coal fields, and from Mounds Station west 26 miles to Grassy Trail Creek and Whitmore Canyon to the Sunnyside coal mines, and thence nine miles up Whitmore Canyon. Of these 6.1 miles is completed on the Clear Creek Coal branch (Aug. 25, p. 603), and 16.7 miles on the Sunnyside branch.

An officer writes that the company expects this winter to extend the San Pete & Servier branch from the present terminus at Belknap, Utah, south eight miles to Marysvale. (Nov. 10, p. 788.)

ST. LOUIS & MEMPHIS.—Grading and track laying are completed for three miles out from Portageville on the Memphis & St. Louis extension from Portageville, Mo., south 14 miles to Bragadocia. There is six miles under contract. Twelve men and three teams are at work. The company expects to build three miles more soon. Seth S. Barnes of New Madrid, Mo., is General Manager. (Official.)

SACRAMENTO & SAN JOAQUIN VALLEY.—H. T. Compton has completed surveys for this proposed line from Stockton, Cal., north to Sacramento. He states that the new line will be from two to three miles shorter than the Southern Pacific line between the two points, which is 48 miles. The Mokelumne is crossed near New Hope with several hundred feet of trestle and two small spans. The general office is Los Angeles, Cal. John Cross of that city is an incorporator. (Oct. 27, p. 753.)

SEARCY & DES ARC.—Grading is reported completed for the entire extension of 4¼ miles from Higginson to Searcy, Ark., and track laying is to be begun at once. (Nov. 17, p. 801.)

SOUTHERN.—Trains have begun runnings over the connecting line from Cayce, S. C., south 32 miles to Perry, on the Carolina Midland line of the company. (Nov. 24, p. 820.)

Location is completed and grading just begun on the Birmingham Southern, west of Pratt City, Ala., from Slope No. 5, southwest about two miles through No. 8 to No. 9. J .E. Locy, of Jaspar, Ala., has the contract. The maximum grade is 1¼ per cent.; the maximum curves 8°. (Aug. 18, p. 589.) There will be one small trestle. (Official.)

The Tennessee Coal, Iron & Railroad switch of two miles at Russellville, Ala., is being built by this company. Reid & Arlington have the contract. (T. C., I. & R., Nov. 17, p. 802.)

An officer writes that there is nothing in the report that his company will build an extension of the tracks at Mobile, Ala. (Nov. 17, p. 801.)

SOUTHERN INDIANA.—This company is building a "Y" at Linton, Ind., and has completed two side tracks immediately south of the city. This is in connection with the extension from Elnora, Ind., northwest 46 miles to Terre Haute. On this, track is laid as far as Linton. (Oct. 27, p. 753.)

SOUTHERN PACIFIC.—Dodge Mason of Kemp, Tex., has taken the contract for building the entire extension from Rockland northwest about 170 miles, via Nacogdoches and Athens, to Cedar. Grading is in progress at several points. (Nov. 10, p. 788.)

TENNESSEE CENTRAL.—The city of Kingston, Tenn., has voted to take $25,000 bonds of this company now building from Rockwood to Clarksville, Tenn., 155 miles. (Nov. 17, p. 802.) Jere Baxter of Nashville, Tenn., is President.

TUSCARORA VALLEY.—Surveys are reported in progress for an extension from Port Royal, Pa., to run northeast about 35 miles to Selin's Grove, on the Pennsylvania. The company has also been building an extension from Blair's Mills southwest toward McConnellsburg.

VANDALIA.—The General Manager confirms the statement that 30 miles of new rails are bought to lay between Indianapolis and East St. Louis. (Nov. 17, p. 802.)

WEST VIRGINIA ROADS.—J. C. Carpenter & Co. of Clarksburg, W. Va., have taken the contract, according to report, to build 16 miles of standard gage road to connect with the Chesapeake & Ohio. The line is to be completed by July 1 next, and most of the contracts for grading and masonry are sublet. It will require three bridges. A New York syndicate is said to be back of the project.

GENERAL RAILROAD NEWS.

BOSTON & ALBANY.—By the terms of the lease of this property to the New York Central & Hudson River, recently announced, the New York Central is to assume charge of the property on July 1, 1900, for 99 years. It may not sub-lease nor assign the lease without written consent. It pays $2,000,000 a year rent, and $10,000 a year for organization expenses for the first 10 years, and a reasonable sum thereafter. It pays all rents and leases now in force on the B. & A. The B. & A. is to issue and re-issue the $7,485,000 bonds now outstanding. The lease may be annulled by mutual consent. It is subject to the approval of the stockholders of both roads, and to revision by the Massachusetts Legislature. (Nov. 24, p. 820.)

CENTRAL PACIFIC.—The London Stock Exchange has appointed a special settling day for $51,482,000 first refunding mortgage 4 per cent. guaranteed gold bonds of 1949 and $24,407,000 3½ per cent, mortgage guarantee gold bonds of 1929. (Oct. 20, p. 738.)

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—The Central Trust Co., New York, trustee, will receive sealed proposals up to noon, Nov. 27, to sell Cincinnati, Indianapolis, St. Louis & Chicago general first mortgage 4 per cent. bonds of Aug. 2, 1886, at not to exceed 102½ and interest, the total amount not to consume more than $78,761.

COLUMBUS, LIMA & MILWAUKEE.—Horton & Co., bankers of New York City, filed a petition at Defiance, O., on Nov. 20, asking for a receiver for the property because of the default in a loan of $42,000 due to them. The road was taken out of the hands of receivers Nov. 1, 1898, after accounts had been adjusted. (Nov. 4, 1898, p. 857.)

GLASGOW.—The town of Glasgow, Ky., has voted to sell this road to a syndicate headed by Hayden Trigg for $60.000. It runs from Glasgow Junction to Glasgow, Ky., 10.5 miles, and is leased to the Louisville & Nashville for five years from Jan. 8, 1897.

LOUISVILLE & NASHVILLE.—Forty-five six per cent. mortgage bonds of the Pensacola & Atlantic were drawn for payment for the sinking fund on Nov. 24, at 110, interest to cease Feb. 1, 1900.

MARICOPA & PHOENIX & SALT RIVER VALLEY.—Sealed proposals are asked by F. I. Kemball, Secretary and Treasury, up to Dec. 14. for as many first 5 per cent. bonds as $15,000 will buy.

MEXICAN NATIONAL.—A press dispatch from London states that the Court of Appeals has reversed the judgment in the case of this company, and unanimously granted leave to issue $4,500.000 of Mexican internal 5's to pay off the 6 per cent. bonds. This suit was brought in 1896 by the Mexican National Co., to obtain authority to sell about $4,554,300 Mexican Government 5 per cent. bonds, held by the trustees of the prior lien loan. The proceeds were to be applied to the redemption of a portion of that loan. (July 14, p. 500.)

MISSOURI, KANSAS & TEXAS.—H. W. Poor & Co. offer the first mortgage extension 50-year gold bonds, due 1994, at 95 and accrued interest.

NEW YORK CENTRAL & HUDSON RIVER.—Stockholders of record, on Dec. 2 will be entitled to subscribe at par until Jan. 2, 1900, for the recently authorized capital stock to the extent of 15 per cent. of their respective holdings. The subscriptions are payable April 2, upon the issue of the new stock. This increases the capital stock from $100,000,000 to $115,000,000. (Oct. 27, p. 754.)

PULLMAN'S PALACE CAR.—A meeting of the new directors is called for Dec. 5, to arrange details for the consolidation into this company of the Wagner Palace Car Co. (Oct. 27, p. 754.)

STATE UNIVERSITY.—Judge Brown, at Durham, N. C., on Nov. 22, appointed Paul C. Graham of Durham as receiver for this property on petition of J. L. Andrews, administrator for C. M. Andrews, to satisfy a judgment for $2,500 damages for injuries received by C. M. Andrews from the railroad. The road runs from University Station to Chapel Hill, 10.2 miles, and is operated as a branch of the Southern.

TOLEDO, ST. LOUIS & KANSAS CITY.—Frank H. Shaffer and Merrill Moore have been appointed Special Masters to conduct the foreclosure sale of this property in the suit of the Continental Trust Co., New York, at a date not yet fixed but not later than Feb. 15. (Nov. 3, p. 770.)

TOMBIGBEE & NORTHERN.—This company was incorporated in Alabama Nov. 25, with a capital stock of $50,000, to build a railroad from Nanahubba Bluff on the Tombigbee River, Mobile County, to run northwest to Healing Springs, Washington County. This is probably successor to the Seaboard of Alabama, which runs from Nanahubba to Turners, 33 miles, and proposes to build to Healing Springs. The road was sold under foreclosure May 10, 1897. The receiver was discharged June 7 following, but continues to operate the road as agent for the purchasers. The incorporators of the new company are: Edward C. Wright, John A. Prescott, C. W. Ogden and Porter B. Godard, Kansas City, Mo.; Edward L. Russell, Henry Tacon and Saffold Berney, Mobile, Ala.

UNION DEPOT & RAILROAD.—This company has been incorporated with a capital stock of $400,000, as successor to a company of the same name, at Denver, Col., whose charter recently expired. The directors are: E. Dickinson, E. Buckingham, W. A. Deuel, E. T. Jeffery and Frank Trumbull. The Union Pacific owns three-fifths of the stock, the Denver & Rio Grande one-fifth and the Colorado & Southern one-fifth.

WABASH.—The President announces that on account of the increased earnings, the directors Dec. 27 decided to pay 3 per cent. interest on the $3,500,000, series A bonds. The last interest payment on these bonds was in July, 1896. It is thought that the earnings will also provide for some distribution on the B bonds, of which there are $26,000,000 outstanding. (Aug. 18, p. 590.)

TRAFFIC.

Traffic Notes.

The newspapers report that the Official Classification Committee, representing the freight departments of the Trunk Line, the Central Traffic and the New England railroads, has agreed upon changes in classification, to take effect Jan. 1, which will effect advances in the rates on a large number of commodities. It is said that the advances will average 10 per cent.

The members of the board of managers of the disbanded Joint Traffic Association, who were appointed a committee to wind up the affairs of the association, have held their final meeting. All business connections and financial matters relating to the work of the Joint Traffic Association have been closed and the offices formerly occupied by the Association at 143 Liberty Street, New York, will soon be vacated.

The Collector of Internal Revenue at New York has promulgated a decision by Commissioner Wilson in which he rules that bills of lading on shipments from the United States to Canada are liable to taxation as export bills of lading at the rate of ten cents for each shipment. It appears that some or all of the railroads have stamped such bills with one-cent stamps. The Commissioner has now ordered the collection of this tax on all bills of lading thus insufficiently stamped since July 1, 1898.

Chicago Traffic Matters.

Chicago, Nov. 29, 1899.

The meeting of the sub-committee of the industrial ocmmission has ended without any startling evidence concerning discriminations in railroad rates having been given, unless the testimony, or rather opinion, of President Stickney of the Chicago Great Western be taken in that light. Mr. Stickney said the Interstate Commerce law and the commission were a farce; that rates were continually being secretly manipulated; that scalping was no great offense and that he saw nothing wrong in a person selling to a scalper a ticket that he had paid for. Mr. Stickney further said that in his opinion the government ought not to meddle with the affairs of the railroads; that they were private corporations and their officers could operate them more successfully if the lawmakers would "keep hands off." Vice-President Morton, of the Atchison, Topeka & Santa Fe, read an interesting paper before the sub-committee advocating pooling as the only successful means of preventing rate manipulations. A number of commercial men protested against any law to permit pooling. A number of the latter have formed an association for the purpose of recommending a number of amendments to the Interstate Commerce laws.

By an arrangement between the Chicago, Milwaukee & St. Paul and the Duluth, South Shore & Atlantic roads the former will be enabled to run through passenger trains between the Lake Superior copper country and Chicago and Milwaukee. The Milwaukee & St. Paul has never before furnished through train service between here and the Michigan peninsular district. The service will be started with one through train daily between Chicago and Houghton.

A second-class passenger rate of $17 has been put in by the Soo line between St. Paul and New York. The St. Paul-Chicago lines and the eastbound roads from here have as yet taken no action to meet this competition, but daily meetings are being held to consider the question.

Thanksgiving Day rates are troubling the general passenger agents of the western roads. There are a number of these officers who are in favor of discontinuing the custom of reducing passenger rates for this holiday on the ground that as they are put in but for one day they cause a demoralization of regular rates that is entirely unnecessary. Little business is originated by the rates, and there is no particular demand for them. However, several of the roads have independently announced that they will reduce rates for Thanksgiving, which, of course, will force all of the lines to do the same.

The Northwestern has made further reductions in the time of its east and westbound limited trains between Chicago and Denver. The eastbound train, known as the "Chicago special," will have its time cut one hour and twenty-five minutes and the westbound, "Colorado special," twenty-five minutes.

The advance in commodity rates agreed upon by the Eastern roads has aroused considerable complaint among Western shippers. The Cincinnati Board of Trade threatens to file a protest before the Interstate Commerce commission and take such other measures as it lawfully may to have the advances abandoned.